WORK PLAN FOR ADDITIONAL SITE ASSESSMENT

GEORGIA-PACIFIC CALIFORNIA WOOD PRODUCTS
MANUFACTURING FACILITY
90 WEST REDWOOD AVENUE
FORT BRAGG, CALIFORNIA
AME PROJECT NO. 16017.07

June 8, 2005

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
"≤"	less than or equal to
"<"	less than
">"	greater than
"≥"	greater than or equal to
°C	degrees Celsius
µ/L	Microgram(s) per liter
1,1-DCA	1,1-dichloroethane
ACM	asbestos-containing materials
AME	Acton • Mickelson • Environmental, Inc.
AOI	area(s) of interest
AST	aboveground storage tank
ASTM	American Society of Testing and Materials
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and xylene
C & T	Curtis & Tompkins, Ltd.
CA LUFT	California Department of Health Services Leaking Underground Fuel Tank Manual (October 1989)
CAM	California Assessment Manual
CDFG	California Department of Fish and Game
CDP	Coastal Development Permit
CFR	Code of Federal Regulations
CHHSL	California Human Health Screening Levels
cis-1,2-DCE	cis-1,2-dichloroethene
COPC	chemical(s) of potential concern
county	Mendocino County
Cr VI	hexavalent chromium
d	day(s)
DCA	dichloroethane
DCE	dichloroethylene
DDAC	didecyldimethylammonium chloride
DQO	data quality objective
DWR	Department of Water Resources
EPA	United States Environmental Protection Agency
ESA	Environmental Site Assessment
ESL	environmental screening level
FID	flame ionization detector
G	amber glass
g	gram(s)
G-P	Georgia-Pacific Company
GP/FPD	gas chromatograph / flame photometric detector
GPR	ground-penetrating radar

Acronym	Definition
GPS	global positioning system
GTI	Groundwater Technology, Inc.
H_2SO_4	sulfuric acid
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
HCL	hydrochloric acid
HNO_3	nitric acid
hr	hour(s)
IRM	interim remedial measure(s)
JP-5	jet fuel
L	liter(s)
LBP	lead-based paints
LCP	City of Fort Bragg Local Coastal Program
LCS	laboratory control sample
LEL	lower explosive limit
LFL	lower flammable limit
MB	Method Blank
MCEH	Mendocino County Department of Public Health, Division of Environmental Health
MEK	2-butanone
mg/kg	milligram(s) per kilogram
mg/L	milligram(s) per liter
mg/m^3	milligram(s) per cubic meter
mL	milliliter(s)
mo	month(s)
MS/MSD	matrix spike/matrix spike duplicate
MTBE	methyl tert-butyl ether
NA	not applicable
$Na_2S_2O_3$	sodium thiosulfate
NaOH	sodium hydroxide
ND	not determined
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NS	no holding time specified
OEHHA	California Office of Environmental Health Hazard Assessment
P	polyethylene
PAH	polynuclear aromatic hydrocarbons
PARCC	precision, accuracy, representativeness, comparability, and completeness
PCB	polychlorinated biphenyls
PCE	tetrachloroethene
PEL	permissible exposure limit
PID	photo ionization detector

Acronym	Definition
ppm	parts per million
ppmv	parts per million by volume
PRG	Preliminary Remediation Goals
PSH	phase-separated hydrocarbon
PVC	polyvinyl chloride
QA/QC	quality assurance/quality control
QAM	Quality Assurance Manual
QAP	Quality Assurance Plan
QL	quantitation limit
RL	reporting limit
RPD	relative percent difference
RSD	relative standard deviation
RWQCB	Regional Water Quality Control Board
SAP	Sampling and Analysis Plan
SGCU	silica gel clean-up
SHSO	Site Health and Safety Officer
site	former Georgia-Pacific California Wood Products Manufacturing Facility, Fort Bragg, California
SOP	standard operating procedure
SVOC	semi-volatile organic compound(s)
TCE	trichloroethylene
TCLP	Toxicity Characteristic Leaching Procedure
TDEM	time domain electromagnetic metal
TMB	trimethylbenzene
TPH	total petroleum hydrocarbon(s)
TPHd	total petroleum hydrocarbon as diesel
TPHg	total petroleum hydrocarbon as gasoline
TPHo	total petroleum hydrocarbon as motor oil
TRC	TRC Companies, Inc.
TRPH	total recoverable petroleum hydrocarbons
TSP	trisodium phosphate
TWA	time weighted average
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System
USGS	United States Geological Survey
UST	underground storage tank
VOA	volatile organic analysis vial
VOC	volatile organic compound(s)
Work Plan	Work Plan for Additional Site Assessment

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1.0 INTRODUCTION

1.1 Main Objectives

This Work Plan for Additional Site Assessment (Work Plan) was prepared at the request of Georgia-Pacific Corporation (G-P) for the Former G-P California Wood Products Manufacturing Facility, Fort Bragg, California (site). Figures 1 and 2 present the site location map and site map with parcel boundaries, respectively. The main objectives of the proposed site assessment are:

- Evaluate the extent of impacts of chemicals of potential concern (COPCs) in site soil, ground water, surface water, and sediments

- Investigate additional areas of concern identified subsequent to previous site investigation activities

- Characterize the site and provide representative concentration data for COPCs in soil, ground water, surface water, and sediments to support a risk-screening assessment and subsequent risk assessment work that considers both human health and ecological resources of concern

The site assessment work will follow recommendations made by the previous consultant, TRC Companies, Inc. (TRC), and will address comments made by the Regional Water Quality Control Board (RWQCB) – North Coast Region regarding prior investigations, which include Phase I and II Environmental Site Assessments (ESAs) and an additional site assessment to supplement the Phase II ESA.

The site assessment activities described herein will be performed in parallel with the work proposed in the Acton • Mickelson • Environmental, Inc. (AME) *Work Plan for Foundation Removal, Additional Investigation, and Interim Remedial Measures*, dated March 21, 2005 (March 21, 2005 Work Plan) and *Addendum #1 Work Plan for Foundation Removal, Additional Investigation, and Interim Remedial Measures* dated May 6, 2005 (Addendum #1). The March 21, 2005 Work Plan incorporates areas that are slated for foundation removal or other excavation activities; it is an integral part of a Coastal Development Permit (CDP) application

required for the work. The March 21, 2005 Work Plan also describes investigation methodology and interim remedial measures (IRMs) associated with building foundation removal in Parcels 3 (Former Mobile Equipment Shop) and 4 (Former Sawmill #1, Lath Plant, and Powerhouse and associated structures), and excavation of geophysical anomalies at Parcels 1 (Glass Beaches #1, #2, and #3), 3 (Scrap Yard), and 10 (Clinker Ash/Scrap Pile Area).

G-P operations at the site ceased in August 2002. Since that time, most site equipment was removed and building and structure demolition commenced under a previously approved CDP. The investigation proposed in the March 21, 2005 Work Plan will commence after demolition and foundation removal at included site structures.

As discussed during a meeting with RWQCB and the California Office of Environmental Health Hazard Assessment (OEHHA) on March 29, 2005, G-P has initiated the process of performing a site Human Health and Ecological Risk Assessment. The initial step of this process is development of risk-based screening levels to identify chemicals and/or areas requiring additional evaluation (e.g., further characterization or removal). The technical approach to the risk assessment and work plans for risk assessment will be submitted separately.

1.2 Work Plan Organization

The Work Plan is divided into the following main sections:

- Section 1.0 - Introduction
- Section 2.0 - Background
- Section 3.0 - Initial Evaluation
- Section 4.0 - Objectives, Data Needs, and Investigation Approach
- Section 5.0 - Scope of Work
- Section 6.0 - Schedule
- Section 7.0 - Remarks
- Section 8.0 - References

The Work Plan described herein will be performed in general accordance with the procedures outlined in the following documents:

- Sampling and Analysis Plan (SAP, Appendix A)
- Health and Safety Plan (HASP, Appendix B)
- Quality Assurance Plan (QAP, Appendix C)

2.0 BACKGROUND

2.1 Summary of Previous Investigations

This section provides a review of previous investigations. Figure 3 is a site map showing the locations of parcels, major buildings, ponds, and other features.

2.1.1 Investigation (1992)

In 1992, Groundwater Technology, Inc. (GTI) conducted an investigation at the two Bunker C fuel aboveground storage tanks (ASTs) located east of the Water Treatment Plant in Parcel 4. The investigation included 15 soil borings with grab ground water sampling. Soil sample total recoverable petroleum hydrocarbon (TRPH) concentrations were greater than 100 milligrams per kilogram (mg/kg) at four soil boring locations in this area. Ground water sample TRPH concentrations ranged up to 200 milligrams per liter (mg/L) in the same area. The environmental assessment report concluded that the area southeast of the tank containment was impacted by heavy end petroleum hydrocarbons (GTI 1992).

2.1.2 Investigation (1998)

In 1998, TRC performed an investigation of Sawmill #1, the Lath Plant, Planers #1 and #50, and the Green Chain north of Sawmill #1. Soil samples were collected at 0.5 and 2.5 feet below ground surface (bgs) at each building or structure and analyzed for total petroleum hydrocarbons (TPH) as diesel (TPHd), TPH as motor oil (TPHo), and polychlorinated biphenyls (PCBs). Two soil samples were analyzed for volatile organic compounds (VOCs), and two sample extracts were analyzed for Toxicity Characteristic Leaching Procedure (TCLP) for TPHd and TPHo.

Detectable concentrations of TPHd and/or TPHo were reported in all but five soil samples. VOCs and PCBs were not reported at concentrations greater than the method reporting limits (RLs). Laboratory analysis reported TPHd and TPHo concentrations at both sample depths at the east and west ends of Sawmill #1 and in the southern half of Planer #1. Soil sample TPHd and TPHo concentrations at Sawmill #1 ranged up to 4,200 and 16,000 mg/kg, respectively, at soil boring SM-12 located exterior of the southwest building corner (Figure 8). Soil sample TPHd and TPHo concentrations interior of Sawmill #1 ranged up to 3,400 and 7,200 mg/kg, respectively, in sample SM-2B/2.5 located near the east end of the building (Figure 9). Analysis of the TCLP extract from sample SM-12B/2.5 reported TPHd and TPHo at concentrations of 2.3 mg/L and 9.1 mg/L, respectively.

Soil sample TPHd and TPHo concentrations at Planer #1 ranged up to 500 and 2,900 mg/kg, respectively, in sample P1-2A/0.5 (Figure 7) (note that Planer #1 boring locations depicted on Figure 7 for TRC's 1998 investigation are prefixed with "98-" to distinguish them from boring locations at Glass Beach #1 that had the same original designation). Analysis of the TCLP extract from sample P1-2A/0.5 reported TPHd at less than the RL of 0.05 mg/L and TPHo at a concentration of 0.23 mg/L.

Samples of near-surface soil were impacted with TPHd and/or TPHo at both sampling locations in the Lath Plant (19 mg/kg TPHd and 100 mg/kg TPHo in sample LP-1A/0.5 and 80 mg/kg TPHd and 650 mg/kg TPHo in sample LP-2A/0.5) and both sampling locations beneath the Green Chain (330 mg/kg TPHd and 1,600 mg/kg TPHo in sample GC-1A/0.5 and 54 mg/kg TPHd and 240 mg/kg TPHo in sample GC-2A/0.5) (Figure 7). At Planer #50, soil sample TPHd and TPHo concentrations ranged up to 81 and 340 mg/kg, respectively, both in sample P50-2A/0.5 located in the eastern half of the building (Figure 7) (TRC 1998).

2.1.3 Phase I Environmental Site Assessment

A Phase I ESA was conducted by TRC from 2001 to 2004 (TRC 2004a) and included:

- Visual inspections of each parcel for environmental concerns
- A site-history survey including historical Sanborn maps, historical United States Geological Survey (USGS) maps, and aerial photograph review
- A survey and sampling of buildings for asbestos-containing materials (ACM) and lead-based paints (LBP)
- Communication with local and Mendocino County regulatory agencies
- A computer-database search of sites with environmental concerns within a 1-mile radius of the site

The Phase I ESA report divided the site into ten parcels, generally based on building types and land usage, and identified approximately 40 areas of potential environmental impact within the parcels. The primary areas of interest (AOIs) were located in Parcels 3, 4, and 5. Potential environmental impacts were also identified in the remaining parcels, though generally to a lesser degree.

2.1.4 Phase II Environmental Site Assessment

A Phase II ESA was performed by TRC from 2003 to 2004 (TRC 2004b) and included:

- Approximately 160 soil borings (with soil and grab ground water sampling)
- 70 potholes
- Installation of 30 ground water monitoring wells
- Geophysical surveys to search for buried items

Laboratory tests were conducted for TPH as gasoline (TPHg), TPHd, TPHo, California Title 22 list of 17 metals (CA Title 22 metals), VOCs and semi-volatile organic compounds (SVOCs), PCBs, pesticides, and herbicides. Grab ground water samples collected at the Former Mobile

Equipment Shop and Machine Shop in Parcel 3 and the Mobile Equipment Shop in Parcel 5 were reported to contain hydrocarbons; however, subsequent monitoring well ground water samples collected in the same area contained lesser reported concentrations of hydrocarbons, with the exception of the sample from upgradient monitoring well MW-3.2.

The areas with soil hydrocarbon impact included but are not limited to the following:

- Glue Lam and Resaw #5 Areas (Parcel 2)
- Former Mobile Equipment Shop, Compressor House, Covered Shed, and Machine Shop Areas (Parcel 3)
- Powerhouse Area (Parcel 4)
- Former Sawmill #1 and Mobile Equipment Shop (Parcel 5)
- Northwest corner of Planer #2 and Shipping Office (Parcel 6)
- Beehive Burner and Fuel ASTs (Parcel 7)

VOCs were reported in soil samples collected at:

- Resaw #5 Area (Parcel 2)
- Former Mobile Equipment Shop Area (Parcel 3)
- Powerhouse Area (Parcel 4)
- East Log Pond Fill Area and Mobile Equipment Shop (Parcel 5)

Pesticides were reported in soil and grab ground water samples collected in the Tree Nursery Area in Parcel 9 (TRC 2004b).

2.1.5 Additional Site Assessment and Quarterly Ground Water Monitoring (2004)

An additional site assessment was proposed by TRC on June 23, 2004 in response to written comments from RWQCB – North Coast Region on the Phase I and Phase II ESAs. The RWQCB approved the work plan for the additional site assessment in a letter dated July 15, 2004. The investigation included potholes and soil borings with soil sampling in the following areas:

- Near the Former Compressor House, Former Scrap Yard, Former Mobile Equipment Shop, Machine Shop, and Covered Shed (Parcel 3)
- Powerhouse and Bunker Fuel AST Areas (Parcel 4)
- East Log Pond Fill Areas (Parcel 5)

- West Log Pond Fill Area and Planer #2 (Parcel 6)
- Sawmill #2 and Mill Ramp Area (Parcel 7)
- Coastal Disturbance Area (Parcel 8)
- Former Tree Nursery (Parcel 9)

The additional site assessment also included geophysical surveys at the Former Scrap Yard (Parcel 3) and Fill Material Area (Parcel 10). Soil samples were analyzed for TPHd, TCLP for TPHd, TPHo, TCLP for TPHo, VOCs, SVOCs, polynuclear aromatic hydrocarbons (PAHs), and CA Title 22 metals.

Petroleum (TPHd and TPHo) TCLP concentrations were reported from samples collected at the Former Scrap Yard, Former Compressor House Area, Machine Shop, Former Bunker Fuel AST Area, East Log Pond Fill Area, Mobile Equipment Shop Area, and northwest corner of Planer #2. TRC concluded that detectable levels of metals, VOCs, and SVOCs were less than United States Environmental Protection Agency (EPA) Preliminary Remediation Goals (PRGs), often used as a screening measure of the need for site cleanup (TRC 2004e).

Quarterly ground water monitoring activities were conducted by TRC through 2004. A phase separated hydrocarbon (PSH) thickness of 0.01 foot was reported in monitoring well MW-5.1 near the Mobile Equipment Shop in Parcel 5 in June, September, and December of 2004. Reported TPHd and TPHo concentrations in ground water samples from monitoring well MW-5.5 ranged up to 610 and 2,100 micrograms per liter (µg/L), respectively. Reported concentrations of TPHg and TPHd ranged up to 180 and 560 µg/L, respectively, in ground water samples from monitoring well MW-3.2 located upgradient of the Former Mobile Equipment Shop in Parcel 3.

Chlorinated VOCs and fuel-related VOCs, particularly methyl tert-butyl ether (MTBE), were reported in ground water samples from Parcel 3 monitoring wells MW-3.1, MW-3.2, and MW-3.3 and Parcel 5 monitoring wells MW-5.1, MW-5.3, MW-5.4, MW-5.6, and MW-5.7. Naphthalene and phenanthrene, both PAHs, were reported in ground water samples from monitoring wells MW-3.2 and MW-5.7, respectively. Barium concentrations up to 9,600 µg/L were reported in ground water samples from monitoring well MW-4.1 (TRC 2005).

2.2 Site Description

The site is located along the coastline in the City of Fort Bragg, Mendocino County, California. Located on approximately 445 acres west of Highway One, the site is bounded to the south by Noyo Bay, to the west and northwest by open Pacific Ocean coastline, and to the northeast and east by the City of Fort Bragg. The site was divided into ten parcels during previous investigations based on historical operations and land use. The parcels are designated as follows:

Parcel Number	Name	Approximate Area (acres)
1	North Coast Zone	62
2	Resaw Plant	9
3	Industrial Parcel	64
4	Power Plant Parcel	12.5
5	Sawmill #1	21
6	Planer Parcel	25
7	Sawmill #2	35
8	Log Storage Parcel	129
9	Nursery Parcel	15
10	South Coastal Zone	58

A site map with parcel boundaries is presented on Figure 2. Each parcel was further divided into identified AOIs based on site reconnaissance activities during the Phase I ESA. Investigations of each AOI were conducted based on past operations and land use.

2.3 Site History

The sawmill at Fort Bragg began operations in 1885. G-P acquired the site in 1973 and officially ceased operations in November 2004. During plant operation, logs were received by truck, unloaded, and stored in log-storage areas. Logs were then removed from inventory, debarked, and milled. Milled lumber was shipped green, kiln dried, or air dried on site. Finished lumber was transported by rail or flatbed trailers. Bark and wood refuse were transported to the power plant by truck, conveyor, or pneumatic system where they were burned to generate steam for electricity (TRC 2004a).

Early site operations were conducted in the two sawmills, planer buildings, a fence plant, a power plant, lumber storage areas, and various maintenance facilities. Based on a review of historical Sanborn maps, early site operations were conducted mainly in Parcels 4 and 5.

The site expanded to its current size over the course of 117 years. Figure 3 is a site map showing the locations of parcels, major buildings, ponds, and other features. In its Phase I ESA report, TRC summarized site contents and operations as follows: Parcels 1 and 8 were primarily used for finished lumber and raw log storage. Parcel 4 contains the Powerhouse, which was used for electricity generation. Parcels 9 and 10 were largely unused for sawmill operations until recently

when the Tree Nursery was constructed in Parcel 9. Mill operations occurred in Parcels 6 and 7, which contain Sawmill #2 and the Planer Building. Parcel 5 contains equipment fueling and maintenance facilities, as well as Sawmill #1, which ceased operation in 1998 and was demolished in 1999 and 2000. Parcel 2 contains a wood-prefabrication plant used for railroad flatcars and fence posts. Parcel 3 contains a sheet metal shop, planer building, kilns, sorter building, and Former Mobile Equipment Shop (TRC 2004a).

2.4 Potential Land Use

Various land use types are proposed for redevelopment of the site. G-P is working closely with the City of Fort Bragg to coordinate planning efforts to help guide reuse of the site. One of the objectives of the City of Fort Bragg is to create a recreation area with open space. Major components of the open space framework include a Glass Beach Buffer, Coastal Trail Corridor, and Mill Pond/Wetland Restoration. Both residential and commercial development is anticipated for portions of the site.

2.5 Environmental Setting

2.5.1 Surface Water

There are nine ponds located in Parcels 1, 4, 5, and 7 (Figure 3). The largest is the Log Pond (Pond 8), which spans Parcels 4 and 5 and has been present since the inception of the mill; it received raw logs for temporary pre-processing storage and received stormwater from the City of Fort Bragg. In review of historical Sanborn maps, it appears the Log Pond was originally larger than its current configuration. The southwest extent of the Log Pond was historically larger than it is currently and extended alongside the City of Fort Bragg wastewater treatment plant property. Both the eastern and western ends of the Log Pond have been filled over time, giving the Log Pond its current configuration.

Ponds 1 through 4 are located in the southern portion of Parcel 7. These ponds consist of a Settling Pond, Aeration/Fire Pond, and two Holding Ponds. Pond 1 is a Settling Pond that received scrubber effluent from the Powerhouse. Water from Pond 1 was gravity fed to Pond 2 (Aeration/Fire Pond), where cyanide levels in the water were reduced. Water from the Aeration Pond was piped west to Pond 3 (Holding Pond) before eventually being pumped to the west end of the Log Pond.

Ponds 6 and 7 are located in Parcel 4. Pond 6 (Collection Pond) was used to collect and evaporate stormwater runoff. Similar to Pond 1, Pond 7 (South Settling Pond) was used as a receiving basin for scrubber effluent from the Powerhouse. Pond 9 (Parcel 1) was used as a source of water for fire hydrants in the vicinity.

2.5.2 Geology and Soil

Fort Bragg is located on the Pacific Coast of Northern California in the Coast Range Geomorphic Province. The bedrock of the region is part of the unnamed Cretaceous to Upper Jurassic marine sedimentary rocks, consisting of sandstone, shale, and conglomerate. Other units

present in the site vicinity are surface geologic units including beach and sand dunes, alluvium, and marine terrace deposits. Much of the coastal bluffs at the site consist of Pleistocene age marine terrace deposits overlying bedrock. These marine terrace deposits are massive, semi-consolidated clay, silt, sand, and gravel, ranging from 1 to 140 feet thickness (TRC 2004a).

Franciscan bedrock is exposed primarily on the tops of ridges, sporadically on the moderately steep slopes, and in area creeks, rivers, and ocean bluffs. Sandstone and shale sea mounts are very common directly offshore of the site. Marine terrace deposits consist of silty sand, gravelly sand, and lenses of gravel. Gravel lenses are frequently exposed at the base of nearly vertical banks of silty sand. In areas where a less steep slope has formed, these sediments are heavily vegetated above the high-tide zone (TRC 2004a).

According to soil boring and pothole logs completed during the Phase II ESA and 2004 additional site assessment, the subsurface beneath the site is primarily composed of poorly graded, well graded, and silty sand with gravel overlying bedrock. Much of the surficial sands are fill materials overlying Quaternary marine terrace deposits of a similar nature. Some layers of clayey silt were encountered beneath the sand layers during the investigation of the Parcel 9 area.

2.5.3 Ground Water

The regional hydrogeologic setting of the Mendocino Coast where the site is located was presented in the *Mendocino County Coastal Ground Water Study,* first published in June 1982 by the State Department of Water Resources. This area is divided into five subunits in the Coastal Groundwater Study: the Westport, Fort Bragg, Albion, Elk, and Point Arena subunits, separated by major rivers that discharge to the Pacific Ocean. The aerial extent of the Coastal Groundwater Study included all areas in which coastal terrace deposits had been mapped. The project site is located within the Fort Bragg subunit, which extends from Big River on the south to Tenmile River on the north (TRC 2004a).

Fresh ground water is primarily obtained from shallow wells in the semi-consolidated marine terrace deposits, or through municipal or privately owned water systems. These water systems divert surface flow and springs or tap shallow alluvial aquifers (TRC 2004b). Depth to ground water has varied from approximately 1 (east area of Parcel 3) to more than 27 feet bgs (southwest area of Parcel 10) (TRC 2005).

Quarterly ground water monitoring activities were conducted by TRC during 2004. Depth to ground water ranged from 1.05 (monitoring well MW-3.6 in January 2004) to 27.42 feet bgs (monitoring well MW-10.4 in September and December 2004). Beginning in the first quarter 2005, quarterly ground water monitoring activities are being conducted by AME.

Figure 4 is a ground water elevation contour map for December 2004. The ground water elevation contour map incorporates the observed hydraulic head at Pond 8, which is approximately 40.1 feet above mean sea level (msl). The inferred ground water flow direction has generally been west-southwest in the northern portion of the site (Parcels 2 and 3),

northwest-to-southwest in the central portion of the site (Parcels 4 and 5), and southwest in the southern portion of the site (Parcel 10).

2.5.4 Biological Assessments

Biological assessments of the site have been conducted. These reports provide assessments of habitats and sensitive flora and fauna at the site. Various species of migratory birds were identified in the assessments, as well as sensitive flora. Also, the City of Fort Bragg has requested that a biologist identify sensitive and endangered plant species in proposed work areas within 100 feet of the top of the coastal bluffs to plan for their protection or relocation.

The biological assessment reports provide an evaluation of each pond to identify jurisdictional waters. Pond 8 (Log Pond) is the only pond under the jurisdiction of the United States Army Corps of Engineers (USACE), California Department of Fish and Game (CDFG), and City of Fort Bragg Local Coastal Program (LCP), as it was constructed by damming an area where natural stream runoff cascaded over the coastal bluff into the ocean. The other eight ponds were constructed for industrial purposes in upland areas that are not part of natural drainage courses and are therefore not considered jurisdictional waters (TRC 2003b).

The vegetated area along Highway 1 in the eastern portion of Parcel 9 contains a catch basin at its northern end that receives drainage from the City of Fort Bragg through underground piping and discharge from a stream channel located along the west side of the area. The stream channel receives stormwater from the Nursery Area and contains standing water during most of the year. An assessment of jurisdictional waters in this area considered the catch basin and stream channel to be part of a wetland as they form part of a natural drainage course and contain flora typical of wetland areas. This wetland falls under the jurisdiction of the USACE, CDFG, and LCP. The vegetated area was not considered to be a wetland as it is separated from the catch basin by an upland area and did exhibit the characteristics of typical wetland vegetation, soil type, and hydrology (TRC 2004c).

2.5.5 Cultural Resources

An archaeological assessment to identify site cultural resources was conducted in March 2003. The assessment identified eight prehistoric and three historic locations. The site was determined to possibly be eligible for listing in the California Register as an historic district. Much of the site was covered by vegetation, pavement, or buildings and therefore was not accessible during the study.

Some of the buildings are more than 45 years old and were recommended for evaluation by an architectural historian before their removal. The report also recommended development of a site-specific cultural resource treatment plan that would detail measures to be taken to mitigate negative cultural resource impacts on the site (TRC 2003a).

A draft *Phase II Determination of Significance Standing Structures* (TRC n.d.) and a draft *Site Specific Treatment Plan for Cultural Resources* (TRC n.d.) were subsequently prepared by TRC.

The Phase II Determination report concluded that the site is eligible for placement in the National Register of Historic Places (NRHP)/California Register under four criteria:

1. As an historic district for its association with development of the redwood lumber industry and the history and development of the City of Fort Bragg

2. For its association with C.R. Johnson, founder and former president of the Union Lumber Company

3. For its unique buildings and equipment associated with the mill's historic use

4. For its potential to contribute data relevant to our understanding of development of the redwood lumber industry (TRC n.d.).

The *Site Specific Treatment Plan* concluded that specific areas contain a moderate to high potential for subsurface historic cultural resources and recommended that an archaeologist and Native American representative be present during any intrusive work to characterize these features (TRC n.d.).

3.0 INITIAL EVALUATION

3.1 Site Conceptual Model

The site conceptual model describes what is known about COPC sources, migration pathways, exposure routes, and possible exposure scenarios. This section presents a discussion of the site conceptual model to provide a general framework for the proposed site assessment work. As discussed during a meeting with the RWQCB and OEHHA on March 29, 2005, G-P has initiated the process of performing a Human Health and Ecological Risk Assessment for the site. A site conceptual model will be developed as part of the technical approach to the risk assessment, and will be submitted separately.

The primary COPC sources consist of materials, equipment, storage containers, and facilities that contain or transmit chemical compounds. These include operational equipment, fuel ASTs and underground storage tanks (USTs), chemical and waste storage, sumps, pits, open burn areas, and waste piles. Specific unit processes and chemical use are considered below in Section 3.2. Secondary COPC sources consist of media affected by the primary sources and include impacted soil, ground water, surface water, and sediments.

At this time, it is anticipated that only one type of human receptor will be used to develop risk-based screening concentrations. According to discussions with OEHHA, this will allow the establishment of a single set of risk-based criteria that can be applied across the site regardless of the parcel being evaluated. For this site, it is proposed to develop risk-based screening concentrations protective of future residential receptors. Specifics on the approach to ecological receptors will be developed as part of the technical approach to the risk assessment, to be submitted separately. Given the number of species and the complexity of biological

communities, each species present at or near the site will not be individually assessed. Rather, indicator species likely to represent actual site species will be used to develop screening criteria.

Migration pathways that exist at the site include airborne vapors, airborne dust, soil, plant uptake from soil, and surface water. Potential exposure routes include inhalation of airborne vapors and airborne dust, ingestion of soil, dermal contact with soil, and consumption of vegetables grown on the site. Ground water is currently not used on the site and is not expected to provide sufficient volume to be a reliable source of water. Therefore, ground water is unlikely to represent a source of drinking water in the future. However, the RWQCB has characterized all ground water in this area as potential municipal water sources. Based on this determination, ground water use will be evaluated separately to assess resource protection.

3.2 Chemicals of Potential Concern

A review of past facility operations was performed to evaluate COPCs at the site. Soil sample analytical parameters will be selected based on past operations at the associated building or location and identified COPCs. Table 1 lists the processes associated with activities on the site, substances used or waste products for these processes, COPCs for these processes, and analytical test methods to be used to assess the potential presence of COPCs. Table 1 also lists available screening levels or other water quality criteria as guidance for selecting appropriate analytical methods and reporting or detection limits. For each chemical class and analytical method (e.g. VOCs, EPA Method 8260), Table 1 lists the lowest screening levels of the individual chemicals.

The review of past facility operations also included a review of available hazardous material inventories, business plans, emergency response plan drawings, and material safety data sheets. Table 2 provides a summary of the review of the hazardous material inventories and emergency response plan drawings.

3.3 Preliminary Cleanup Levels

As discussed during a meeting with the RWQCB and OEHHA on March 29, 2005, G-P has initiated the process of performing a Human Health and Ecological Risk Assessment for the site. The initial step of this process is development of risk-based screening levels to identify chemicals and/or areas requiring additional evaluation (e.g., further characterization or removal). However, to guide the evaluation of data quality objectives (DQOs) and the execution of IRMs until site-specific screening levels are developed through risk assessment activities, AME proposes the use of the following published soil screening guidelines:

- Environmental Screening Levels (ESLs) established by the RWQCB - San Francisco Bay in *Screening for Environmental Concerns at Sites with Contaminated Soil and Groundwater* dated February 2005

- California Human Health Screening Levels (CHHSLs) established by the California Environmental Protection Agency in *Use of California Human Health Screening Levels (CHHSLs) in Evaluation of Contaminated Properties* dated January 2005

Screening levels will be developed using a health protective risk-based approach reviewed and approved by OEHHA. Approval of these risk-screening levels prior to the start of field activities would result in their use instead of ESLs or CHHSLs. If field activities start before site-specific screening levels are approved, ESLs or CHHSLs will be used until such time that site-specific screening levels are available.

Any investigation/IRM activity conducted using ESLs or CHHSLs for guidance will be compared to site-specific screening levels to assess whether additional activity (e.g., further removal) is warranted. If an ESL and CHHSL exist for a specific compound, then the lesser of the two levels will be used. Comparisons of reported soil concentrations from investigation/IRM work will be made on a chemical-specific basis.

4.0 OBJECTIVES, DATA NEEDS, AND INVESTIGATION APPROACH

The main objectives of the proposed site assessment are:

- Evaluate the extent of impacts of COPCs in soil, ground water, surface water, and sediments at the site

- Investigate additional areas of concern identified subsequent to previous site investigation activities

- Characterize the site and provide representative concentration data for COPCs in soil, ground water, surface water, and sediments to support a risk-screening assessment and subsequent risk assessment work that considers both human health and ecological resources of concern

4.1 Specific Objectives

Specific objectives of this Work Plan in support of the main objectives include the following:

- Evaluate historical processes and waste streams to support selection of COPCs, and provide a summary of the process evaluation.

- Identify COPCs for the site, based on the evaluation of historical processes and waste streams and a review of existing analytical data.

- Specify DQOs for the site assessment work. First, identify preliminary cleanup levels and goals for both human health and ecological risk. Second, select analytical methods and required detection limits based on the cleanup levels and goals.

- Review historical site records to assist in the investigation of additional AOIs identified subsequent to previous site investigation activities.

Specific objectives of the site assessment activities proposed in this Work Plan include the following:

- Collect and analyze samples in accordance with the DQOs to evaluate the extent of COPC impacts in surface soil (0 to 2 feet bgs), deeper soil (below 2 feet bgs), ground water, surface water, and sediments at the site.

- Characterize additional fill areas identified subsequent to previous site investigation activities. Specific objectives include: 1) characterize the lateral and vertical extent of the fill area; 2) identify areas of buried metal and other debris; 3) identify areas of elevated soil conductivity that may suggest the presence of COPC impacts; and 4) evaluate concentrations of COPCs in identified fill materials.

- Characterize waste materials (e.g. clinker ash/scrap piles) to evaluate removal and disposal options.

- Collect and analyze samples to obtain representative concentration data for COPCs in surface water, pond sediments, and storm drain sediments.

- Investigate the depth of pond sediments.

- As warranted, collect soil samples to provide background dataset(s) to use as naturally occurring chemical concentrations, particularly for metals. The need for background sampling will be identified as part of a data review and development of a technical approach to the risk assessment, to be submitted separately.

- Provide for the evaluation of temporal changes in COPC concentrations in ground water near source areas, downgradient locations, and/or potential exposure pathways through the installation of ground water monitoring wells.

- Characterize ground water flow directions and gradients through the installation of monitoring wells and piezometers.

4.2 Data Needs and Data Quality Objectives

The following are the general data needs to meet the stated objectives of the site assessment:

- Geophysical survey of areas of fill materials, with identified anomalies indicative of potential buried debris and/or waste and lateral variations in soil conditions

- Sample analytical data for concentrations of COPCs in surface soil (0 to 2 feet bgs), deeper soil (below 2 feet bgs), ground water, surface water, sediments, fill materials, and waste material at the site

- Lithologic descriptions of soil, fill materials, and pond sediments extending to native soil in the case of fill materials and pond sediments

- Periodic ground water elevation data and ground water analytical data from ground water monitoring wells

- Surveyed sample locations and ground water monitoring well locations and elevations

- Storm drain locations and general surface water flow patterns

For each chemical class or, in some cases, individual COPC, Table 3 provides a summary of the proposed analytical methods and RLs or detection limits. The QAP includes additional numerical DQOs for the investigation. Section 5.0 provides the details of the proposed site assessment for individual areas.

4.3 Remedial Investigation Strategy and Approach

The following is a general overview of the approach to the proposed site assessment activities included in this Work Plan. The specific scope of work for individual areas is described in Section 5.0, and will vary from the general approach for certain areas such as ponds, storm drains, clinker and ash/scrap piles, and associated media (i.e., sediment, surface water, and stockpiled materials). The SAP provides details of sampling and analytical methodologies. The general approach to the investigation is as follows:

1. Perform geophysical surveys of areas of fill materials, where specified.

2. Drill soil borings at the locations specified in this Work Plan. Using direct push methods, obtain continuous cores for logging of subsurface materials and select samples of surface soil (0 to 2 feet bgs), deeper soil (below 2 feet bgs), sediments, and fill materials. Criteria for selecting soil samples for analysis are described below. Collect grab ground water samples from the direct push borings with a peristaltic pump. At some locations (e.g., ponds and waste fill), alternative drilling/sampling technologies may be more efficient.

3. Review the results of sample analyses from the initial borings and grab ground water samples. Where warranted, select locations for additional borings based on the criteria described below.

4. Obtain soil, sediment, fill material, and grab ground water samples using direct push methods from the additional locations.

5. Review the results of sample analyses from the additional borings and grab ground water samples. Where warranted, select locations for ground water monitoring wells based on the criteria described below.

Soil, sediment, and fill material samples will be selected from continuous cores obtained from the soil borings. For the purpose of the risk screening assessment, subsurface soils are subdivided into two strata: shallow soils, which extend from the ground surface to 2 feet bgs, and deeper soils, which are below 2 feet bgs. At a minimum, soil samples will be collected for analysis at 1 foot bgs (mid-point of the shallow soil stratum), 5 feet bgs, and every additional 5 feet bgs thereafter until the water table is reached. One soil sample will be collected immediately above the water table. Additional soil samples will be retained for analysis based on the visual logging of the soil cores and field screening with an organic vapor monitor, as detailed in the SAP.

After reviewing the results of sample analyses from the initial borings and grab ground water samples, locations for additional borings may be selected. Samples obtained from the additional locations will be analyzed for a subset of the COPCs. The locations and analytical parameters will be based on the following data needs:

- Characterize the extent of reported COPC concentrations above screening levels in soil, sediment, fill material, and/or ground water at outlying locations

- Evaluate apparent lateral or vertical trends in COPC concentrations in soil, sediment, fill material and/or ground water relative to screening levels

- Collect samples at additional locations to provide additional data on COPCs for risk screening assessment purposes

- Verify previous sample analytical results

Following review of the results of sample analyses from the additional borings and grab ground water samples, locations for the installation of monitoring wells will be specified based on the following criteria:

- Monitoring of reported COPC concentrations in grab ground water samples above screening levels, particularly at downgradient locations

- Verification of the presence of reported COPCs in grab ground water samples (e.g., detection of metals)

- If ground water impacts from COPCs are identified by the grab ground water sampling at contiguous locations, monitoring temporal changes in areas of ground water impact near source areas and near downgradient edges

- Characterization of ground water flow directions and gradients
- Monitoring for potential impacts to ecological receptors

5.0 SCOPE OF WORK

Table 4 summarizes previous site recommendations and relates them to this Work Plan. Table 5 contains a scope of work summary.

5.1 Parcel 1

The majority of Parcel 1 (Figure 5) was historically utilized for lumber storage and surface treatment. Parcel 1 includes the following AOIs:

- Pump House
- Explosives Bunker

Parcel 1 also includes Glass Beaches #1, #2, and #3. Excavation and removal of previously identified debris and geophysical anomalies and soil sampling were proposed under AME's March 21, 2005 Work Plan.

5.1.1 Pump House

5.1.1.1 Background

The Pump House was constructed in the late 1950s and contains two diesel motors used to pump water from a fire-water pond to fire hydrants on Parcel 1 (Figure 5). A 500-gallon diesel AST that provides fuel to the engines is located within a concrete berm outside the Pump House. Staining was not observed within the concrete berm during the Phase I ESA (TRC 2004a).

5.1.1.2 Previous Sampling and Analysis

One soil boring (P1-16) was completed west of the Pump House during TRC's Phase II ESA. Black hydrocarbon staining and a mild hydrocarbon odor were noted from 2 to 6 feet bgs.

Soil and ground water samples were analyzed for TPHg and TPHd. Analysis of soil samples without silica gel cleanup (SGCU) reported TPHd ranging from 11 to 12 mg/kg. Analysis of a grab ground water sample without SGCU reported TPHd at a concentration of 190 µg/L and TPHg at less than the RL of 50 µg/L (TRC 2004b).

5.1.1.3 Proposed Sampling and Analysis

Additional investigation in the Pump House Area is proposed to assess the extent of soil TPHd impact (see Figure 5 for sampling locations) and includes:

- Two direct push soil borings will be advanced west of the Pump House, with continuous soil and grab ground water sampling performed at each soil boring.

- Select soil and ground water samples will be analyzed for TPHd, TPHo, and VOCs.

- Based on the analytical results, one or more ground water monitoring wells will be installed with 10 feet of screen casing as described in the SAP (Appendix A) to evaluate ground water conditions in the area.

5.1.2 Explosives Bunker

5.1.2.1 Background

A bunker formerly used to store explosives is located near the top edge of the bluff within Glass Beach #2 (Figure 5). The structure is a concrete above-grade bunker approximately 8 feet square by 9 feet high with a concrete roof. A single iron door is located on the north side of the structure, with the exterior hinges rusted shut. A heavy piece of concrete rubble blocks the door. Two 6-inch diameter vents are located on two sides approximately 1 foot below the roof, formerly screened but now open due to corrosion.

Faded signage reads "EXPLOSIVES - KEEP OUT." According to G-P staff, the bunker was used until approximately 1965 to store dynamite, blasting caps, fuses, and possibly nitroglycerin. Another former wooden explosives storage shed located approximately 50 feet north was demolished prior to 1960.

5.1.2.2 Previous Sampling and Analysis

There is no record of any previous sampling and analysis of the Explosives Bunker.

5.1.2.3 Proposed Sampling and Analysis

Investigation of the Explosives Bunker is proposed and includes:

- The interior of the bunker will be inspected with a remote/fiber optic camera to verify that it is empty.

- Two direct push soil borings will be advanced to the water table. One boring will be located immediately outside the door on the north side of the bunker, and one boring will be located 50 feet to the north in the area of the former wooden shed (Figure 5).

- Soil and grab ground water samples will be analyzed for nitrate and nitroglycerine.

5.2 Parcel 2

The majority of Parcel 2 (Figure 6) was used for log storage until a High-Ceiling Wooden Warehouse was built there between 1958 and 1963 (Figure 6). Parcel 2 AOIs consist of the following:

- High-Ceiling Wooden Warehouse
- Helicopter Pad

5.2.1 High-Ceiling Wooden Warehouse

5.2.1.1 Background

The High-Ceiling Wooden Warehouse was constructed in phases between 1958 and 1963 and is divided into four areas: Resaw #5, Glue Lam, Breezeway, and Dry Shed #2 (Figure 6). The majority of Parcel 2 was used for log storage until the structure was built. The building is under lease to Pacific Marine Farms, who has sub-leased the building to other tenants. Staining was observed on the asphalt floor within the building and on asphalt within and east of the Breezeway Area (TRC 2004a).

5.2.1.2 Previous Sampling and Analysis

Seven soil borings (P2-1 through P2-4, P2-4A, P2-5, and P2-6) were completed and two ground water monitoring wells (MW-2.2 and MW-2.3) installed at the Resaw #5 and Glue Lam Areas during the Phase II ESA (TRC 2004b).

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, VOCs, and CA Title 22 metals. Laboratory analysis of soil samples without SGCU reported TPHd ranging from 3.3 to 700 mg/kg at Resaw #5 and from 1.8 to 1,800 mg/kg at the Glue Lam Area. Soil sample TPHg concentrations ranged from 6.7 to 19 mg/kg at Resaw #5 and were reported at less than the RL at the Glue Lam Area. Soil sample TPHd concentrations in both areas were reported predominately in the uppermost 1 to 2 feet bgs of soil. Soil sample TPHd concentrations decreased with depth (P2-4 decreased from 150 mg/kg at 1 foot bgs to 3.3 mg/kg at 5 feet bgs). Concentrations of lead (43 mg/kg), zinc (120 mg/kg), and mercury (0.59 mg/kg) were reported in the soil sample collected from soil boring P2-4 at 2 feet bgs (TRC 2004b). Various VOCs were reported in soil and grab ground water samples from soil borings at Resaw #5 and Glue Lam Areas.

Laboratory analysis of grab ground water samples from soil borings in the two areas reported TPHd ranging from 74 (with SGCU) to 1,000 µg/L (without SGCU) and TPHg from less than the RL of 50 to 180 µg/L (soil boring P2-4A) (TRC 2004b). Quarterly ground water monitoring of monitoring well MW-2.3 at Resaw #5 reported TPHg at a concentration of 110 µg/L in December 2004 and 60 µg/L in the June 2004 sampling (TRC 2005).

5.2.1.3 Proposed Sampling and Analysis

Additional investigation is proposed in the High-Ceiling Wooden Warehouse (see Figure 6) and includes:

- Two ground water monitoring wells will be constructed and screened from 5 to 15 feet bgs.
  - One ground water monitoring well will be installed west of the Breezeway between the Resaw #5 and Glue Lam Areas, downgradient of monitoring well MW-2.3.
    - Based on a northwesterly historical ground water-flow direction in this area, the monitoring well will be located approximately 50 feet west of the Breezeway to evaluate the downgradient extent of ground water TPHd impact reported at soil borings P2-2, P2-4A, P2-5, and P2-6, and monitoring well MW-2.3.
  - One monitoring well will be installed southeast of soil boring P2-2 to evaluate ground water conditions upgradient of the facility.
- Soil and ground water samples will be collected and selectively analyzed for TPHd, TPHg, VOCs, phenol, resorcinol, and CA Title 22 metals.

5.2.2 Helicopter Pad

5.2.2.1 Background

A Helicopter Pad is adjacent to the north side of Dry Shed #2. Staining of the asphalt surface was observed in this area (TRC 2004a) (Figure 6).

5.2.2.2 Previous Sampling and Analysis

One soil boring (P2-11) and one ground water monitoring well (MW-2.1) were completed at the Helicopter Pad. Soil and ground water samples were analyzed for TPHg, TPHd, and TPHo. Soil-sample TPHd concentrations ranged from less than the RL of 1 to 13 mg/kg (P2-11). TPHd was reported at a concentration of 180 µg/L in the grab ground water sample from soil boring P2-11 (TRC 2004b). Analysis of quarterly ground water samples from monitoring well MW-2.1 has not indicated potential environmental impacts (TRC 2005).

5.2.2.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Helicopter Pad (see Figure 6) and includes:

- Two ground water monitoring wells will be constructed and screened from 5 to 15 feet bgs.

- One monitoring well will be installed northwest of monitoring well MW-2.1 to evaluate downgradient ground water conditions.

- One monitoring well will be installed northwest of soil boring P2-11 to further evaluate TPHd impact reported in the grab ground water sample from that soil boring.

- Soil and ground water samples will be collected and selectively analyzed for TPHd, TPHg, VOCs (including benzene, toluene, ethylbenzene, and xylenes), and CA Title 22 metals.

5.3 Parcel 3

Parcel 3 consists of the following AOIs (Figure 7):

- Railroad Spurs
- Former Planer #1
- Dry Sheds #4 and #5
- Former Mobile Equipment Shop
- Construction Engineering
- Machine Shop and Sheet Metal / Plumbing / Plant Supply
- Covered Shed

Parcel 3 also includes the Scrap Yard Area located near the top of the coastal bluffs, the Former Mobile Equipment Shop, and Compressor House (Building #11). Excavation and removal of identified geophysical anomalies was proposed for the Scrap Yard under AME's March 21, 2005 Work Plan. The March 21, 2005 Work Plan also included soil sampling and excavation, if warranted, beneath removed foundations at the Former Mobile Equipment Shop and Compressor House.

5.3.1 Railroad Spurs

5.3.1.1 Background

Railroad Spurs are located north and west of Former Planer #1 and east of the Truck Loading Shed. Railcars were loaded and unloaded in this area. During Former Planer #1 operations, locomotives were used along the Railroad Spurs to move railcars for transport (TRC 2004a) (Figure 7).

5.3.1.2 Previous Sampling and Analysis

Ten near-surface soil samples (P3-4 through P3-13) were collected by TRC in 2003 in the vicinity of the Railroad Spurs and were analyzed for TPHd, TPHg, SVOCs, and CA Title 22 metals. TPHd concentrations in soil ranged up to 1,900 mg/kg (sample P3-12). The remainder of the soil TPHd concentrations ranged from 2.5 to 93 mg/kg. TPHg was reported at less than the RL of 1 mg/kg in each sample. SVOCs were not detected at concentrations greater than the RL.

Based on the coordinates given for pothole P3-PH2 in the log, the location appears to be incorrectly labeled on Figure 5 in TRC's 2004 Phase II ESA report. As there are two sampling locations labeled "P3-13/P3-PH4," it is assumed that the northerly location north of Dry Shed #4 actually represents pothole P3-PH2 and soil boring P3-12, based on the coordinates provided in the log for P3-PH2.

5.3.1.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Railroad Spurs (see Figure 7) to further characterize area soil and ground water conditions and includes:

- A total of 12 soil borings.
  - Two of the soil borings along the Railroad Spur will be located near previous soil boring P3-12 and continuously sampled to the water table, where grab ground water samples will be collected to evaluate the lateral and vertical extent of COPC impact where the soil TPHd concentration is the highest.
- Soil and ground water samples will be analyzed for TPHd, VOCs, PAHs, and CA Title 22 metals.

5.3.2 Former Planer #1

5.3.2.1 Background

Former Planer #1 was constructed prior to the early 1950s and was demolished in the late 1990s (Figure 7). The floor is asphalt with concrete foundations at former equipment locations and concrete building footings. The area formerly occupied by the building remains undeveloped. Two equipment foundations filled with sand are located in the northeast building corner. The walls of the pits are concrete lined; however, the depths are unknown. Hydrocarbon stained sand and wood were observed in the pits (TRC 2004a).

A drum-storage containment area was located in the southeast corner of the building. The storage area is concrete with concrete berms and a metal grate cover. According to G-P personnel, drums containing oil and related products were stored there (TRC 2004a). The former building contained a dip tank near the southwest building corner (TRC 1998). An area that contained transformers according to a 1960s facility map is located between Former Planer #1 and Planer #50.

5.3.2.2 Previous Sampling and Analysis

TRC collected soil samples from six locations at 0.5 and 2.5 feet bgs in Former Planer #1 in 1998, and completed an additional six soil borings and three monitoring wells in the vicinity of Former Planer #1 in 2003.

Soil and ground water samples were analyzed for TPHg, TPHd, VOCs, and PCBs. Soil-sample TPHd concentrations ranged from less than the RL of 1 to 610 mg/kg (sample P1-1A/0.5), and TPHo concentrations ranged from less than the RL of 2 to 2,900 mg/kg (sample P1-2A/0.5). There was a decrease in TPH concentration with depth at each sampling location, and TPH was reported predominately in the southern half of the building area.

Analysis of grab ground water samples reported TPHd ranging from 130 to 580 µg/L and carbon disulfide at a maximum of 1.6 µg/L. Analysis of monitoring-well ground water samples reported TPHd at a concentration of 150 µg/L at monitoring well MW-3.9 in June 2004. MTBE was reported at a maximum of 1.1 µg/L and tetrachloroethene (PCE) at a maximum of 0.6 µg/L, both in the September 2004 sample from monitoring well MW-3.7, the most downgradient of the three monitoring wells. Depth to ground water in the monitoring wells has ranged from 4.1 to 9.6 feet bgs (TRC 2005).

5.3.2.3 Proposed Sampling and Analysis

Additional investigation is proposed at Former Planer #1 (see Figure 7) to assess the lateral and vertical extent of soil TPHd and TPHo impact as well as COPCs associated with lumber dip tank treatment. Efforts will focus on the southern half of the building, where COPC concentrations were reported. Investigation of the two foundation pits in the northeast area of the former buildings is also proposed (see Figure 7) and includes:

- Four direct push soil borings with grab ground water sampling will be advanced and continuously soil sampled to the water table at locations intermediate to former soil borings 98-P1-1 through 98-P1-4.

- Select soil samples will be analyzed for pentachlorophenol, tetrachlorophenol, dioxins and furans (where pentachlorophenol is detected), propiconazole, didecyldimethylammonium chloride (DDAC), TPHd, TPHo, and VOCs.

- Three direct push soil borings will be advanced and continuously soil sampled to the water table in the former transformer area between Former Planer #1 and Planer #50.

  - Selected soil samples will be analyzed for PCBs.

- Based on the findings an evaluation will be made to select monitoring well locations (tentative locations are shown on Figure 7):

  - One ground water monitoring well will be constructed where sample analysis indicates the greatest potential impact and screened from 5 to 15 feet bgs, and a second monitoring well will be installed downgradient of the first monitoring well as described below and based on the historical ground water flow direction.

  - One ground water monitoring well will be constructed and screened from 5 to 15 feet bgs to characterize TPHd and TPHo impact downgradient of Former Planer #1.

- Two direct push borings with soil and grab ground water sampling will be advanced at the two sand- and wood-filled foundation pits in the northeast area of Former Planer #1.

- The grab ground water and selected soil samples will be analyzed for TPHd, TPHo, PAHs, and VOCs.

5.3.3 Dry Sheds #4 and #5

5.3.3.1 Background

Dry Sheds #4 and #5 were used solely for lumber storage during plant operations (Figure 7). Both buildings are wooden with concrete footings for wood support beams. Flooring in Dry Shed #4 and the main drive areas of Dry Shed #5 consist of asphalt. Lumber storage areas of Dry Shed #5 consist of bare earth. Stains were observed in the vehicle travel areas of Dry Shed #5 (TRC 2004a).

A dip tank was located outside the northwest corner of Dry Shed #4. During operation, wood was dipped into the tank, which contained wood-preservative chemicals. The dip tank was set into the ground with the open top flush with the ground surface. According to facility personnel, the dip tank was abandoned in place (TRC 2004a).

A 1960s facility map shows a building labeled "Lumber Treating" in the approximate area of previous soil borings P3-56 and P3-57, which were placed in the area of the dip tank. The map indicates that it was located at the northwest corner of existing Dry Shed #4 and measured approximately 125 feet north-to-south by 40 feet east-to-west.

5.3.3.2 Previous Sampling and Analysis

Four soil borings (P3-26, P3-27, P3-56, and P3-57) were completed on the west and north sides of Dry Shed #4 during the Phase II ESA.

Soil samples were analyzed for VOCs, SVOCs, and PCBs. One grab ground water sample was analyzed for VOCs and SVOCs. All analytical data were reported at less than the method RLs (TRC 2004b).

Chlorophenol ingredients (pentachlorophenol and tetrachlorophenol) were potentially used in treating wood products in the vicinity of Dry Sheds #4 and #5 (RWQCB – North Coast Region 2005). Chemical analysis of samples collected from this area during the Phase II investigation did not include tetrachlorophenol as an analyte.

5.3.3.3 Proposed Sampling and Analysis

The RWQCB recommended investigation of four general locations (former dip tank, Green-Chain Area, and lumber-storage and lumber-loading areas) to evaluate potential chlorophenol impacts to soil and ground water (RWQCB, 2005). The Green-Chain Area will be investigated as

part of the March 21, 2005 Work Plan. Previous soil borings P3-56 and P3-57 appear to be located just north of the center of the Former Lumber Treating building location.

Additional investigation, primarily for phenols as recommended by the RWQCB, is proposed in the vicinity of the former dip tank and Lumber Treating building (Figure 7) and includes:

- Two soil borings will be advanced and continuously soil sampled down to the water table, where grab ground water samples will be collected, within the Former Lumber Treating Building Area.
  - Of the two soil borings, one will be located approximately 40 feet south of the northwest corner of Dry Shed #4 and the second approximately 60 feet north of the northwest corner.
- One soil boring further downgradient will be advanced and continuously soil sampled down to the water table, where a grab ground water sample will be collected, approximately 75 feet west-southwest of the northwest corner of Dry Shed #4.
- Soil and ground water samples will be selectively analyzed for pentachlorophenol, tetrachlorophenol, and dioxins and furans (where pentachlorophenol is detected).

5.3.4 Former Mobile Equipment Shop

5.3.4.1 Background

The Former Mobile Equipment Shop consisted of two buildings with concrete foundations (Figure 7). The buildings were built in the late 1960s to early 1970s and demolished in the late 1980s to early 1990s. The northern building was used as a lube bay (main building area), fuel-dispensing area (north side of building), and equipment-wash area (south side of building), and the south building was used for equipment storage and washing. Water resulting from equipment washing was directed to a concrete catch basin located immediately south of the south building. A concrete sump is located immediately east of the catch basin. An approximate 10-foot length of metal pipe extends southward from the south building foundation (AME 2005). The area east of the Former Mobile Equipment Shop contains offsite railroad mechanical operations.

5.3.4.2 Previous Sampling and Analysis

Eleven soil borings and three ground water monitoring wells were completed at the Former Mobile Equipment Shop.

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, VOCs, and CA Title 22 metals and reported TPHg, TPHd, TPHo and VOC concentrations in soil and TPHg, TPHd, and VOC concentrations in ground water (TRC 2004b). Soil sample TPHg concentrations ranged up to 340 mg/kg while TPHd and TPHo ranged up to 4,800 and 5,100 mg/kg, respectively. VOCs detected in soil samples include 2-butanone, MTBE, naphthalene, and sec-butylbenzene. Analysis of monitoring well ground water samples reported the presence of TPHg, TPHd, TPHo,

and VOCs including 1,1-DCA, cis-1,2-dichloroethene (cis-1,2-DCE), 1,1-DCA, MTBE, PCE, and xylenes (TRC 2005).

5.3.4.3 Proposed Sampling and Analysis

The Former Mobile Equipment Shop building foundations are planned for demolition under the recently submitted CDP. As an IRM, impacted soils exposed following foundation removal will be sampled, analyzed, and removed as appropriate.

Additional assessment of the extent of soil and ground water impact, particularly for TPH and MTBE, is proposed at the Former Mobile Equipment Shop. Because MTBE was detected in soil and ground water samples from soil boring P3-35 and chlorinated VOCs were detected in multiple ground water samples (including samples from the three monitoring wells) the lateral and vertical extent of these compounds requires further investigation. Proposed investigation (see Figure 7) includes:

- Three soil borings with grab ground water sampling will be advanced northeast, west, and southwest of the Former Mobile Equipment Shop.

- Based on an evaluation of data from the initial borings, approximately three ground water monitoring wells will be constructed in the vicinity of the Former Mobile Equipment Shop (soil samples will be collected at 5-foot intervals during drilling, and grab ground water samples will be collected at the water table).

- Soil and ground water samples will be selectively analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, ethylene glycol, and PAHs.

5.3.5 Construction Engineering

5.3.5.1 Background

Construction Engineering is a wooden building constructed between 1952 and 1957 that consists of an open storage area, an indoor storage area, an office area, and a nearby portable storage shed (Figure 7). The open storage area, located north of the building and containing both bare earth and asphalt flooring, stored paint, thinners, enamels, small transformers and associated transformer insulation pieces, various equipment, metal parts, and open 5-gallon buckets of unknown contents. The indoor storage area is located in the south portion of the building and contains additional paints, thinners, and solvents as well as employee lockers, tools, and associated parts.

5.3.5.2 Previous Sampling and Analysis

Previous investigations included seven soil borings. Grab ground water samples were collected from two of these locations.

Soil and ground water samples were analyzed for TPHg, TPHd, VOCs, PCBs, and CA Title 22 metals. Analysis of soil samples reported TPHd concentrations ranging from 2.5 to 170 mg/kg and total xylenes up to 0.093 mg/kg. Grab ground water sample analyses reported concentrations of TPHd ranging from less than the RL of 50 to 180 µg/L. VOCs including carbon disulfide and xylenes were reported in the grab ground water samples. TPHd was reported at a concentration of 80 mg/kg in a soil sample collected near the storage shed at 1 foot bgs (soil boring P3-60) (TRC 2004b).

5.3.5.3 Proposed Sampling and Analysis

Additional investigation is proposed at Construction Engineering (see Figure 7) to further characterize soil TPH impact in the area and includes:

- Two soil borings will be advanced with a direct push drill rig and continuously soil sampled to the water table, where grab ground water samples will be collected, in the area of the portable storage shed.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, PCBs, CA Title 22 Metals, and PAHs.

  - A ground water monitoring well (with 10 feet of screen casing) may be installed, if warranted, based on the analytical results of grab ground water samples.

5.3.6 Machine Shop and Sheet Metal / Plumbing / Plant Supply

5.3.6.1 Background

The Machine Shop and Sheet Metal / Plumbing / Plant Supply building complex consists of three buildings: Machine Shop, Sheet Metal / Plumbing / Plant Supply, and a small Storage Shed north of the Machine Shop (Figure 7).

MACHINE SHOP BUILDING

The Machine Shop was rebuilt after a fire demolished the original building in 1908. The wooden floor was replaced with a concrete floor in the 1950s though the wooden building structure remains (TRC 2004a).

Substances used or stored in the Machine Shop included lubrication oil, used oil, heating coolant, paint, petroleum solvent, and pressurized oxygen and acetylene. Dark staining of the concrete floor was observed around equipment areas (TRC 2004a).

A small sump located near the center of the floor drained directly to the ground though was no longer in use at the time of TRC's Phase I ESA. A section of patched flooring was observed south of the sump. According to plant personnel, machinery formerly at that location wore away the concrete floor over time. Bare ground surface was exposed for a period of time, but the concrete floor was eventually patched.

A compressed air line is located at the west exterior of the Machine Shop. Dark staining was observed near the southwest corner of the building and resulted from oil being blown out of the pipeline due to clogging of the oil/water separator in the air compressor.

SHEET METAL / PLUMBING / PLANT SUPPLY BUILDING

The L-shaped Sheet Metal / Plumbing / Plant Supply building was constructed in 1978 south of the Machine Shop. It is constructed of corrugated metal walls and a concrete floor. The west portion of the building contains sheet metal and plumbing operations and the east portion is used for storage of various parts and accessories for plant operations. An open storage shed is located on the south side of the Plant Supply building, and an outdoor plastic drum storage area was located east of the shed during TRC's Phase I ESA.

Dark staining was observed at a location along the north side of the Sheet Metal / Plumbing portion of the building during the Phase I ESA. The staining is from oil released from air compressor piping similar to that described at the Machine Shop. Staining was also noted in the northern area of the building where equipment was housed and beneath a metal oil-storage container in the northwest portion of the building. Petroleum solvent was also stored in this area (TRC 2004a).

The eastern portion of the Plant Supply building housed various parts and small equipment. Two 1-gallon buckets of lithium and nicad batteries were observed in the southern portion of the building. One 55-gallon drum of cleaner/degreaser was observed in the northeast area and spray paint cans were noted in a locked cabinet in the northwest building corner. Floor staining was not observed in the Plant Supply building.

STORAGE SHED

A Storage Shed north of the Machine Shop formerly housed containers of used oil, heating oil, lube oil, and cutting fluid. The Storage Shed is constructed of a concrete base with metal grating and wooden walls. The ground between the Machine Shop and the shed is covered with asphalt and the area was used to store metal parts. Staining was not observed on the asphalt or Storage Shed concrete floor (TRC 2004a).

5.3.6.2 Previous Sampling and Analysis

Previous investigations at the Machine Shop and Sheet Metal / Plumbing / Plant Supply building complex included seven soil borings (P3-49 through P3-53, P3-63, and P3-64) and three ground water monitoring wells (MW-3.4 through MW-3.6) located west of the buildings (TRC 2004b).

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, VOCs, PCBs, and CA Title 22 metals. Soil sample TPHd concentrations were reported at soil borings P3-49 (150 mg/kg at 1 foot bgs) west of the Storage Shed, P3-50 (270 mg/kg at 1 foot bgs) west of Sheet Metal / Plumbing, and P3-51 (960 mg/kg at 1 foot bgs) at the west interior of the Machine Shop. Soil TPHo concentrations were also reported in the 1 foot bgs samples from soil borings P3-49 (1,200 mg/kg) and P3-50 (500 mg/kg). Soil TPHd and TPHo concentrations decreased with

depth as indicated by the analysis of samples collected at 5 feet bgs at each location. Lead was reported at a concentration of 240 mg/kg in the soil sample from soil boring P3-50 at 1 foot bgs.

Analysis of grab ground water samples at the Machine Shop reported TPHd concentrations of 670 µg/L (soil boring P3-52 [360 µg/L with SGCU]) and 4,100 µg/L (soil boring P3-51 without SGCU) (TRC 2004b). TPHg, TPHd, and TPHo have not been reported at concentrations greater than their respective RLs in quarterly monitoring well ground water samples (TRC 2005).

5.3.6.3 Proposed Sampling and Analysis

Further investigation of the lateral and vertical extent of soil and ground water impact is proposed at the Machine Shop building complex. Efforts will focus on further assessing the extent of COPC impact in known impacted areas as well as characterizing areas most likely to be impacted beneath the buildings (i.e., stained areas, hazardous material storage areas, beneath floor and foundation cracks, sumps, and pits). Proposed investigation (see Figure 7) includes:

- Ten soil borings will be advanced at locations where sample analysis reported impact by petroleum hydrocarbons and continuously soil sampled down to the water table, where grab ground water samples will be collected (this drilling program will be undertaken following building demolition under a future CDP).
  - Three direct push soil borings will be advanced around previous soil boring P3-49 to evaluate the extent of COPC impact in soil in the area near the Storage Shed.
  - Three soil borings will be advanced near previous soil boring P3-51 (interior of the Machine Shop) to evaluate the extent of COPC impact in soil within the structure.
  - Four soil borings will be advanced near previous soil boring P3-50 and the oil-stained area at the southwest corner of the Machine Shop.
- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, PCBs, PAHs, and CA Title 22 metals.
  - If warranted, additional soil boring locations will be evaluated based on the analytical results.

5.3.7 Covered Shed

5.3.7.1 Background

The Covered Shed is located on Parcel 3 approximately 50 feet east of the Plant Supply building (Figure 7). The shed is of open construction with a corrugated metal roof and metal supports over a concrete pad. The shed was constructed in the 1980s or 90s and measures approximately 40 by 40 feet. Metal parts, piping, and motors were observed on the concrete pad during the Phase I ESA. Documentation review indicated former storage of 2,500 gallons of lubricant in 55-

gallon drums and 110 gallons of paint thinner in the area of the Covered Shed; however, it is unclear whether storage was actually within the shed (TRC 2004a).

5.3.7.2 Previous Sampling and Analysis

Two soil borings were drilled at the Covered Shed during the previous Phase II ESA by TRC. Soil boring P3-54 was advanced near the northeast building corner and soil boring P3-55 was advanced near the southwest corner.

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, VOCs, and CA Title 22 metals. Cadmium (17 mg/kg), lead (320 mg/kg), and zinc (3,000 mg/kg) were reported in the soil sample from soil boring P3-54 at 1 foot bgs; however, there was a decrease in the concentration of each metal with depth (1.1 mg/kg cadmium, 17 mg/kg lead, and 51 mg/kg zinc at 5 feet bgs). TPHd and TPHo were reported at concentrations of 1,800 and 6,800 mg/kg, respectively, in the soil sample from soil boring P3-54 at 1 foot bgs, though concentrations of both COPCs also exhibited a decrease with depth (150 mg/kg TPHd and 170 mg/kg TPHo at 5 feet bgs).

Analysis of the grab ground water sample from soil boring P3-54 reported PCE and trichloroethylene (TCE) at concentrations of 3.4 and 0.5 µg/L, respectively. Zinc was reported at a concentration of 170 µg/L in the grab ground water sample from soil boring P3-54 (TRC 2004b).

5.3.7.3 Proposed Sampling and Analysis

Additional investigation of the Covered Shed Area is proposed (see Figure 7) and includes:

- Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, following demolition of the building under a future CDP.
  - One soil boring will be advanced east of the building.
  - One soil boring will be advanced within the building footprint.
  - One soil boring will be advanced west of the building.
- Soil and ground water samples will be analyzed for TPHd, TPHo, VOCs, PAHs, and CA Title 22 metals.
  - Soil samples will be selected for laboratory testing based on visual field observations and PID screening.

5.4 Parcel 4

Parcel 4 (Figure 8) consists of the following AOIs addressed in this Work Plan:

- Ponds
- Equipment Fueling Area by Hog Fuel Pile
- Former Bunker Fuel ASTs

Parcel 4 also includes the following areas that were addressed in AME's March 21, 2005 Work Plan:

- Former Sawmill #1 (Building #12)
- Powerhouse and associated buildings (Building #13)
- Fuel Barn (Building #14)
- Chipper Building (Building #15)
- Water Treatment Plant (Building #16)
- Powerhouse Fuel Storage Building (Building #17)
- Water Supply Switch Building
- Dewatering Slabs
- Sewage Pump Station

5.4.1 Ponds

Included in Parcel 4 are Ponds 6, 7, and the Former Pond between Pond 6 and the Fuel Barn (Figure 8). For Pond 8, see Section 5.11.

5.4.1.1 Background

Ponds 6 and 7 are located west and southwest of the Fuel Barn, respectively. The north and south Former Ponds are located north and east of Pond 6, respectively.

POND 6

Pond 6 was constructed to collect and evaporate stormwater runoff. Sediments suspended in the storm water accumulated within the pond over time. During TRC's Phase I ESA, the pond was approximately 2 feet deep with some vegetation. At times when the pond reached capacity, water was pumped to the water and aeration ponds. Wood chips were stockpiled east of Pond 6 prior to transport to the Fuel Barn. According to plant personnel, ash was not stored in this area (TRC 2004a).

POND 7

Pond 7 (Collection Pond) received scrubber effluent pumped from the Powerhouse. The scrubber effluent contained detectable concentrations of cyanide. A sheen was observed in the east and

west areas of the pond during the Phase I ESA. Three overhead transformers were also observed west of Pond 7. Potential PCB impact exists in the transformers' vicinity due to their age.

FORMER NORTH AND SOUTH PONDS

A small pond containing water and thick vegetation was observed north of Pond 6 during the Phase I ESA. At the same time, ash was observed on the ground surface. The pond was used as a settling pond for a hydraulic de-barker, but has not been used for many years according to plant personnel. Wet fly ash was stored in the area and transported offsite upon drying (TRC 2004a). A second former pond east of Pond 6 was described in correspondence from the RWQCB (RWQCB – North Coast Region 2005). The eastern former pond was filled during operation of the plant.

5.4.1.2 Previous Sampling and Analysis

Two surface water samples (WCP1 and WCP2) were collected from Pond 6 during the Phase II ESA. The samples were analyzed for CA Title 22 metals, TPHg, TPHd, TPHo, VOCs, and SVOCs. Barium was reported at concentrations up to 130 µg/L (sample WCP1) and beryllium was reported at a concentration of 3.3 µg/L (sample WCP2). There were no other detections greater than the method RLs.

5.4.1.3 Proposed Sampling and Analysis

Investigation is proposed in the area of the Ponds (see Figure 8) and includes:

- Three soil borings will be advanced in each of Ponds 6 and 7 and continuously sampled until native material is encountered.
- Three soil borings will be advanced in the Former South Pond Area and one soil boring will be advanced in the Former North Pond Area and continuously sampled until native material is encountered.
- Sediment samples will be collected at each pond using the following general procedures.
  - The sampling location will be land surveyed using GPS equipment.
  - The water depth will be measured at each sampling location using a weighted tape measure.
  - Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment.
  - An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location.

- Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment thickness.

- Samples will be retained within clear acetate liners and examined both visually and with a photo ionization detector (PID) or flame ionization detector (FID) for COPC impact evidence.

- Sediment samples will be selectively analyzed for TPHg, TPHd, TPHo, VOCs, PAHs, cyanide, PCBs, dioxins and furans, hexavalent chromium (Cr VI), and CA Title 22 metals.

- A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.

  - Surface water samples will be field-filtered and analyzed for CA Title 22 metals.

  - Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.

5.4.2 Equipment Fueling Area near the Hog Fuel Pile

5.4.2.1 Background

The Equipment Fueling Area near the Hog Fuel Pile was formerly used for refueling facility trucks and heavy equipment and consisted of a 500-gallon Diesel AST near the northwest corner of the Fuel Barn. According to G-P personnel, there was no underground fuel supply line in this area as fuel was gravity-fed to vehicles using an aboveground pipeline. There was no investigation of potential environmental impacts associated with the Former Diesel AST.

5.4.2.2 Previous Sampling and Analysis

There is no record of any previous sampling and analysis of the Equipment Fueling Area near the Hog Fuel Pile.

5.4.2.3 Proposed Sampling and Analysis

Investigation is proposed at the Equipment Fueling Area near the Hog Fuel Pile (Figure 8) and includes:

- Two direct push borings will be advanced and continuously soil sampled down to the water table, where grab ground water samples will be collected.

- Soil and ground water samples will be selectively analyzed for target-analyte compounds associated with diesel fuel (i.e., TPHd, BTEX, and PAHs).

5.4.3 Former Bunker Fuel Aboveground Storage Tanks

5.4.3.1 Background

Two bunker fuel steel ASTs (20,000 and 25,000 gallons) within concrete secondary containment were installed between the Powerhouse Fuel Storage and Water Treatment Plant in the 1950s and removed in 1996, according to plant personnel (Figure 8). The concrete secondary containment was reportedly weathered and cracked (TRC 2004a).

GTI conducted an environmental investigation of the Bunker Fuel AST Area in 1992 in response to observations of an oily sheen on the water table during excavation to replace a ruptured water line (GTI 1992).

TRC conducted a geophysical survey as part of their Phase II ESA covering an area of approximately 260 feet east-to-west and 100 feet north-to-south. Much of the area was covered with grass and cattails during the survey, but ground-surface staining was not observed during the ESA (TRC 2004a). The survey reported:

- An area of decayed railroad ties in grass approximately 25 feet north of the Water Treatment Plant.
- Four concrete footers with embedded I-beams at the west end of the short-grass area.
- Exposed piping and steel reinforcing bars near the survey area's southeast corner.
- A water tank and fuel-oil AST at the top of the slope on the survey area's north side.
- Utility lines (i.e, electric, water, fuel oil, and undifferentiated utilities).
  - An electric line trending north-south approximately 7 feet east of the building.
  - Water lines, including a metallic line serving the Water Treatment Plant from the water tank to the north, and a set of non-metallic laterals intersecting a wooden valve box near the survey area's eastern edge.
  - A fuel-oil line (known to transect the area but not located during the survey because it was believed to be non-metallic). The alignment of the line was plotted based on an exit point at the northeast corner of the Fuel Barn and an observed entry point (TRC, 2004a).
  - Undifferentiated utility lines.
    - Two lines near the survey area's southwest corner (one of which may be a water line serving a nearby fire hydrant).

- Two lines trending east-west near the northern survey limit (one line at the east end and one at the west end).
- A piping segment approximately 45 feet northeast of the Water Treatment Plant.
- Three partially exposed lines at the southeast corner of the Water Treatment Plant.

5.4.3.2 Previous Sampling and Analysis

GTI completed 15 soil borings during their environmental investigation. Soil samples were collected from 2 to 6 feet bgs for laboratory analysis of TRPH using EPA Method 418.1.

Soil-sample TRPH concentrations ranged up to 11,000 mg/kg, south of the southeast corner of the containment area (soil borings SB-5 and SB-6). Analysis of grab ground water samples reported a maximum TRPH concentration of 200 mg/L (soil boring SB-7 at the containment area's southeast interior) (GTI 1992).

TRC completed six soil borings (P4-11, P4-12, and P4-17 through P4-20) in the Former AST area during their Phase II ESA. Soil staining and a hydrocarbon odor were noticed at soil boring P4-17. Ground water was encountered at approximately 4 feet bgs in soil borings P4-11, P4-12, P4-18, and P4-20 (TRC 2004b).

Soil and ground water samples were analyzed for TPHg, TPHd, VOCs, SVOCs, cadmium, chromium, lead, nickel, and zinc. Analysis of soil samples reported TPHd concentrations ranging up to 42 mg/kg (soil boring P4-17). Grab ground water sample TPHd concentrations ranged up to 85 µg/L (TRC 2004b).

5.4.3.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Former Bunker Fuel ASTs (Figure 8) and includes:

- Four direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the impacted area identified in the 1992 GTI investigation report.
- Soil and ground water samples will be selectively analyzed for TPHo, TPHd, PAHs, and CA Title 22 metals.
- After reviewing the analytical data, additional soil boring locations may be selected to further assess the extent of soil and ground water COPC impact.

5.4.4 Investigation of Geophysical Anomalies

Geophysical surveys were conducted in two areas of Parcel 4: one area at the Former Bunker Fuel AST Area northeast of the Water Treatment Plant and a second area north of the Powerhouse and Transformer Pad. The surveys identified geophysical anomalies in each area

that have yet to be investigated by intrusive methods. The maps provided in Appendix A of TRC's Phase II ESA report will be reviewed to field-map the locations of geophysical anomalies that are consistent with localized buried metallic objects.

Two of the anomalies north of the Powerhouse are irregularly shaped and consistent with metal debris. The third anomaly is rectangular, measures approximately 8 by 13 feet, and was possibly located deeper than the ground penetrating radar (GPR) survey's limits.

West of the Water Treatment Plant's northwest corner, an anomaly was mapped measuring approximately 6 by 30 feet and possibly representing buried metal debris. Two magnetic anomalies were also mapped in the area: one approximately 25 feet north of the building and a second approximately 30 feet northwest of the northwest building corner. Potholing of these areas is proposed to evaluate the nature of the anomalies.

5.5 Parcel 5

Parcel 5 consists of the following AOIs (Figure 9):

- Truck Wash Pit
- Mobile Equipment Shop
- Area West of Mobile Equipment Shop
- Transformer Pad
- Fuel Storage and Dispenser Building
- Tire Shop
- Log Pond East Fill Area
- Former Oil House
- Former Open Refuse-Fire, Engine House, and Number 5 Shingle Mill

5.5.1 Truck Wash Pit

5.5.1.1 Background

According to RWQCB records, an open pit (since backfilled) southwest of the Fuel Storage and Dispenser Building received wastewater from truck-washing operations (Figure 9). RWQCB staff noted during a 1987 inspection that pit soils appeared to be impacted with oil (one soil boring completed to 8 feet bgs did not reach the bottom of the pit wastes). There was also an AST next to the pit, and a separator associated with the pit may be an oil trap identified in the TRC Phase I ESA (RWQCB – North Coast Region 2005).

5.5.1.2 Previous Sampling and Analysis

Soil borings P5-32 and P5-34 and monitoring well MW-5.5 were completed near the southwest corner of the current Fuel Storage and Dispenser Building as part of a limited investigation in the Phase II ESA.

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, and VOCs. Analysis of soil samples reported TPHd up to 190 mg/kg at 3 feet bgs in soil boring P5-34. At monitoring well MW-5.5, TPHd and TPHo were reported in samples up to concentrations of 970 and 1,100 mg/kg at 5 feet bgs, respectively. Concentrations of toluene (0.0018 mg/kg), 2-butanone (0.021 mg/kg), and 1,2,4-trimethylbenzene (1,2,4-TMB) (0.08 mg/kg) were also reported in a soil sample from 5 feet bgs in monitoring well MW-5.5 (TRC 2004b). Ground water TPHd and TPHo concentrations in samples from monitoring well MW-5.5 during September 2004 ranged up to 610 and 2,100 µg/L, respectively (TRC 2005).

5.5.1.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Truck Wash near the southwest corner of the Fuel Storage and Dispenser Building to identify the former pit, AST, and oil-trap locations. Proposed investigation (see Figure 9) includes:

- RWQCB memos and photographs will be reviewed to assist in sampling location placement.
- Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the area (discussed in Section 5.5.5.3 also).
- Soil and ground water samples will be analyzed for TPHg, TPHd, TPHo, VOCs, CA Title 22 metals, and PAHs based on visual observations and PID screening.

5.5.2 Mobile Equipment Shop

5.5.2.1 Background

The Mobile Equipment Shop is a wooden structure measuring approximately 250 by 70 feet with a concrete and asphalt floor (Figure 9). The building was constructed in the late 1940s and has eight metal roll-up doors and maintenance bays: three on the east side, four on the west side, and one on the south side. Oil stains have been observed on the floor at each of the four west maintenance bays and the south maintenance bay (TRC 2004a). The Mobile Equipment Shop also includes:

- A second-floor office and open area along the east side of the building.
- Below the office and open area are:
  - Three rooms that formerly contained equipment such as used tractor and automobile parts, generators, car batteries, paints, and propane tanks.
  - Two former metal-shop rooms.
  - A former lunch room.

  - A former restroom.

- A former paint-storage room at the northwest corner of the building interior.
- A former oil-change waste pit at the northern interior.
  - Approximately 60 feet long by 7 feet deep by 5 feet wide.
  - Metal grates cover the top of the pit and a concrete-lined trench at the bottom of the pit.
  - Wooden planks over the concrete flooring south of the oil-change pit cover a 5-foot deep concrete-lined pit (TRC 2004a).
- A former oil/fuel dispenser north of the oil-change waste pit.
- A room formerly housing an air compressor north of the oil/fuel dispenser at the building exterior.
- Underground used oil and lube oil piping from former ASTs in the Fuel Storage and Dispenser Building.
  - Runs along the west side of the building and ends south of the northwest corner.
  - Enters the building and formerly connected to the interior oil/fuel dispenser adjacent to the former paint-storage room.
- A concrete pad (used for a former diesel dispenser) at the northwest exterior of the building.
- A former pump and sump located east of the air-compressor room.
- An exterior shed formerly used for chemical storage near the northeast building corner (accessible from inside the Mobile Equipment Shop).
  - Contains a metal-grate floor overlying a concrete-lined basin, which is approximately 0.5-foot deep at the center, formerly used as secondary containment for chemical storage, and contains oil-stained areas of concrete observed during the Phase I ESA.
  - During the Phase I reconnaissance, TRC observed four 275-gallon ASTs inside the shed: one anti-freeze AST, one gear-lube AST, one transmission fluid AST, and one hydraulic fluid AST.
  - Also formerly contained gear-lube oil, heavy-duty grease, motor oil, used oil filters, sorbent waste, anti-freeze, and lube oil.

- A second exterior shed on the west side of the building near the southwest building corner (accessible from inside the Mobile Equipment Shop).
  - Constructed similar to the north shed with a metal-grate floor above a shallow concrete basin where areas of oil-stained concrete were observed during the Phase I ESA.
  - Formerly contained four 27-gallon ASTs: three ASTs for hydraulic fluid and one AST for transmission fluid.
  - Formerly contained five plastic and metal 55-gallon drums that contained gear-lube, used oil, waste paint-related material, used oil filters, and lube oil.
  - Formerly contained two open 55-gallon drums cut in half containing used oil, oil-stained cardboard, oil-stained spill pads, and booms.
- A concrete-lined pit covered by a perforated steel plate at the south exterior of the Mobile Equipment Shop.
  - The pit formerly contained water and sludge that was periodically removed (TRC 2004a).

5.5.2.2 Previous Sampling and Analysis

Soil and ground water samples collected during the Phase II ESA were analyzed for TPHg, TPHd, VOCs, SVOCs, and CA Title 22 metals. Concentrations of TPHd, TPHg, VOCs, and SVOCs were reported in soil and ground water samples. Soil-sample TPHd and TPHg concentrations ranged up to 2,800 mg/kg (pothole P5-PH3 at 8 feet bgs) (TRC 2004e) and 600 mg/kg (soil boring P5-23 at 5 feet bgs), respectively.

Pothole P5-PH3 was located outside of the northeast building corner, and soil boring P5-23 was located near the waste oil-change pit. At soil boring P5-23 and pothole P5-PH3, there was an increase in TPHd concentration with depth. SVOCs naphthalene and 2-methylnaphthalene were also reported in the soil sample from soil boring P5-23 at 5 feet bgs. VOCs (e.g., xylenes, ethylbenzene, and isomers of butylbenzene) were reported in soil samples, primarily beneath the northern portion of the building.

Concentrations of TPHd up to 46,000 µg/L at soil boring P5-18, and TPHg up to 2,100 µg/L at soil boring P5-22 were reported in grab ground water samples from soil borings completed at the Mobile Equipment Shop. VOCs (PCE, TCE, cis-1,2-DCE, 1,2,4-TMB, and xylenes) and SVOCs (naphthalene and 2-methylnaphthalene) were also reported in grab ground water samples (TRC 2004b).

Ground water table elevations differ between monitoring well MW-5.1 (located west and hydraulically downgradient of the building) and monitoring well MW-5.2 (located east and upgradient of the building). The monitoring wells are located approximately 110 feet apart and

have an average ground water elevation differential of approximately 10 feet. There is no explanation of this in the logs for these monitoring wells. Quarterly monitoring of downgradient monitoring well MW-5.1 indicates PSH on the water table; however, COPCs have not been detected in samples from upgradient monitoring well MW-5.2.

5.5.2.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Mobile Equipment Shop to further assess the lateral and vertical extent of soil COPC impact and lateral extent of ground water COPC impact. The soil investigation will follow building demolition under a future CDP to expedite drilling-equipment access and will focus on the northern area of the building where soil impact was predominately reported. Soil sampling of areas beneath foundations will be conducted following foundation demolition and removal under a future CDP. Proposed investigation (see Figure 9) includes:

- The used oil and lube oil piping west of the building will be removed. Soil beneath the pipeline will be assessed for petroleum impact. If warranted, soil samples will be collected beneath the pipeline for laboratory analysis.

- Four soil borings will be advanced and continuously sampled down to the water table, where grab ground water samples will be collected to aid in the placement of ground water monitoring wells, outside of the area encompassed by previous soil borings P5-22 through P5-24 to characterize the lateral and vertical extent of soil COPC impact.

- At least one soil boring will be advanced and continuously sampled down to the water table, where a grab ground water sample will be collected to aid in the placement of ground water monitoring wells, at the north shed to evaluate potential sources of COPC impact.

- At least one soil boring will be advanced and continuously sampled down to the water table, where a grab ground water sample will be collected to aid in the placement of ground water monitoring wells, at the west shed to evaluate potential sources of COPC impact.

- Selected soil and ground water samples will be analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, and PAHs.

- Selected ground water samples will be analyzed for ethylene glycol.

An evaluation of ground water conditions in the vicinity of the Mobile Equipment Shop will tentatively be performed, including:

- One monitoring well north of the building constructed and screened from 5 to 20 feet bgs.

- One monitoring well south of the oil-change pit constructed and screened from 5 to 20 feet bgs to evaluate the extent of ground water COPC impact to the north and south.

- Ground water samples will be analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, and PAHs.

- In an effort to evaluate whether offsite sources are contributing chlorinated-VOC impact to the ground water, existing monitoring wells at the east adjacent gas station will be sampled concurrently with the onsite monitoring wells.

5.5.3 Area West of Mobile Equipment Shop

5.5.3.1 Background

The Area West of the Mobile Equipment Shop consists of an unpaved vacant lot (Figure 9). A potential diesel AST location was identified in the area during the Phase I ESA, and some minor petroleum hydrocarbon spills occurred in the same area (TRC 2004a). Underground piping of dual-wall construction (TRC 2004a) runs along the west side of the Mobile Equipment Shop to the former ASTs in the Fuel Storage and Dispenser Building.

Primarily to identify potential USTs, a geophysical survey covering an area measuring approximately 205 feet north-south by 80 feet east-west was conducted of the area west of the Mobile Equipment Shop during the Phase II ESA. Four anomalies were identified in the metal-detector survey, and each location was excavated to assess the nature of the anomaly. A buried metal culvert was reported at two of the locations. The remaining anomaly locations were consistent with small isolated objects such as valve covers or utility pull boxes. There were no USTs reported during excavation of the anomaly areas (TRC 2004b).

A 1,000-gallon diesel UST located west of the Mobile Equipment Shop was identified on the 1960s facility map. This UST location has not been investigated during previous studies. Correspondence from the RWQCB recommended investigation of the former UST area during any future work (RWQCB 2005).

5.5.3.2 Previous Sampling and Analysis

Soil and ground water samples collected in the Area West of the Mobile Equipment Shop were analyzed for TPHg, TPHd, TPHo, VOCs, SVOCs, and CA Title 22 metals. Analysis of soil samples reported TPHd, TPHo, and TPHg at maximum concentrations of 3,600, 11,000, and 84 mg/kg, respectively, each in soil boring SB-1 at 5 feet bgs. There was a decrease in TPHd concentration with depth in soil borings P5-25 and P5-26 where samples were analyzed at 1 and 5 feet bgs. Soil TPHd concentrations also decreased by one to two orders of magnitude to the west of soil borings P5-25 and P5-26 where lesser concentrations were reported in samples from soil borings P5-45, P5-10, and P5-11. VOCs (e.g., 1,3,5-TMB and chlorinated hydrocarbons cis-1,2-DCE and 1,1-dichloroethane [1,1-DCA]) were reported in the 5-feet-bgs soil sample from monitoring well MW-5.3 collected near the water table.

Ground water was encountered between 6 and 11 feet bgs during drilling west of the Mobile Equipment Shop. Ground water petroleum hydrocarbon impact was reported at several sampling locations. Analysis of grab ground water samples reported maximum TPHd, TPHg, and TPHo concentrations of 720,000 (soil boring P5-10), 12,000 (soil boring P5-45), and 8,300 µg/L (soil boring P5-45), respectively. VOCs (i.e., xylenes, MTBE, 1,2,4-TMB, naphthalene, butylbenzene isomers, and chlorinated solvents PCE, TCE, and cis-1,2-DCE) were reported in grab ground water samples. Analysis of quarterly ground water samples from the monitoring wells reported concentrations of TPHd, benzene, xylenes, MTBE, naphthalene, TCE, cis-1,2-DCE, and 1,1-DCA. PSH at a thickness of 0.01 foot was reported on the water table in monitoring well MW-5.1 (TRC 2005).

5.5.3.3 Proposed Sampling and Analysis

Additional investigation in the Area West of the Mobile Equipment Shop (see Figure 9) to further assess the lateral and vertical extent of COPC impact to soil and ground water is proposed and includes:

- One soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, in the area of the former 1,000-gallon Diesel UST.

- One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, north of the geophysical survey area.

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, west of the geophysical survey area.

- One soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, to the southwest of soil boring SB-1 to evaluate the extent of COPC impact.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, TPHg, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.

  - Based on the soil and ground water analytical data, locations may be selected for ground water monitoring wells, which will be screened from 5 to 15 feet bgs.

5.5.4 Transformer Pad

5.5.4.1 Background

A concrete Transformer Pad measuring approximately 20 by 70 feet and surrounded by an 8-foot-high painted fence is located approximately 200 feet north of the Mobile Equipment Shop

on the north side of Pond 5 (Figure 9). Transformers currently located on the pad do not contain PCBs (TRC 2004a).

5.5.4.2 Previous Sampling and Analysis

Three soil samples (P5-14 through P5-16) were collected at 0.5 foot bgs at the Transformer Pad during the Phase II ESA.

Analysis of the soil samples for PCBs reported PCBs as Aroclor-1260 at a concentration of 0.035 mg/kg in sample P5-14. PCBs were not detected in the other samples at concentrations greater than the method RL of 0.012 mg/kg (TRC 2004b).

5.5.4.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Transformer Pad (see Figure 9) to assess the extent of soil PCB impact in the area and includes:

- Four direct push soil borings will be advanced and continuously sampled to the water table in the vicinity of previous sample P5-14 (located near the northeast corner of the pad).
  - Two soil samples from each soil boring will be analyzed for PCBs.

5.5.5 Fuel Storage and Dispenser Building

5.5.5.1 Background

The Fuel Storage and Dispenser Building is located south of the Mobile Equipment Shop, measures approximately 120 by 45 feet by 25 feet high, and was constructed of corrugated metal sides around a steel frame (Figure 9). The area formerly contained:

- Four ASTs (20,000-gallon diesel fuel, 12,000-gallon unleaded gasoline, 7,000-gallon lube oil, and 4,000-gallon waste oil) within a concrete secondary-containment berm (4 feet deep with 2 feet extending above ground surface) in the western half of the building.
  - Petroleum-stained areas were observed near the former AST locations within the concrete containment berm during the Phase I ESA (TRC 2004a).
- Four dispenser islands located in the eastern half of the structure.
  - Potential petroleum-impacted sludge was observed within the dispenser-island trench during the Phase I ESA (TRC 2004a).
- Piping from the dispensers to the ASTs within a concrete-lined trench covered by a metal grate.

The area presently contains the following:

- Piping from the northwest corner of the structure running underground from the waste-oil and lube-oil ASTs northward along the west side of the Mobile Equipment Shop.

- An additional covered trench for compressed-air piping running from the Fuel Storage and Dispenser Building to the Truck Wash.

5.5.5.2 Previous Sampling and Analysis

Five soil borings (P5-32 through P5-36) with grab ground water sampling and one monitoring well (MW-5.5) were completed in the vicinity of the Fuel Storage and Dispenser Building during the Phase II ESA.

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, and VOCs. Analysis of soil samples reported TPHd and TPHo at maximum concentrations of 970 and 1,100 mg/kg, respectively, both in monitoring well MW-5.5 at 5 feet bgs. Concentrations of toluene, 1,2,4-trimethylbenzene (TMB), and 2-butanone were also reported in the same soil sample, which was collected within 0.5 foot of the water table. TPHd was reported at a concentration of 190 mg/kg in the soil sample from soil boring P5-34 at 3 feet bgs.

Analysis of grab ground water samples in the vicinity of the Fuel Storage and Dispenser Building reported TPHd at a maximum concentration of 350 µg/L (soil boring P5-35). Maximum monitoring well ground water sample TPHd and TPHo concentrations of 610 and 2,100 µg/L, respectively, were reported for monitoring well MW-5.5. VOCs, SVOCs, and PAHs have not been reported at concentrations greater than their respective method RLs in samples from monitoring well MW-5.5 (TRC 2005).

5.5.5.3 Proposed Sampling and Analysis

Additional investigation is proposed in the vicinity of the Fuel Storage and Dispenser Building (see Figure 9) to assess the extent of soil and ground water COPC impacts and includes:

- Four direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, beneath the former AST locations (one soil boring for each AST).

- Eight additional soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the perimeter of the area where petroleum impact was reported.

  - Two soil borings east and southwest of soil boring P5-35.

  - One soil boring south of soil boring P5-36.

  - Five soil borings in the vicinity of soil boring P5-34 and monitoring well MW-5.5 (three of these borings were described in Section 5.5.1.3 and will also serve to investigate the Truck Wash Pit).

- Soil and ground water samples will be analyzed for TPHd, TPHo, TPHg, VOCs, lead, and PAHs to evaluate subsurface conditions.

  - Additional soil borings may be added to the program based on the findings from the initial sample analyses.

5.5.6 Tire Shop

5.5.6.1 Background

The Tire Shop is located west of the southern end of the Mobile Equipment Shop, was constructed in the late 1980s to early 1990s, measures approximately 40 by 50 feet, and is wooden with a concrete floor and large metal doors to allow vehicle access for tire repairs and replacement (Figure 9). Historical aerial photographs taken from 1963 to 1982 show a different building at the Tire Shop location; however, no records are available regarding its use (TRC 2004a).

5.5.6.2 Previous Sampling and Analysis

Two soil borings (P5-37 and P5-38) and one monitoring well (MW-5.3) were completed in the vicinity of the Tire Shop during the Phase II ESA. Soil boring P5-37 was located approximately 20 feet west of the Tire Shop, and soil boring P5-38 and monitoring well MW-5.3 were located 50 and 75 feet south of the building, respectively. Saturated conditions were observed in soil boring P5-37 at 0.5 foot bgs and monitoring well MW-5.3 at 6 feet bgs but were not encountered in soil boring P5-38 at 5 feet bgs.

Soil and ground water samples were analyzed for TPHg, TPHd, and TPHo. Analysis of soil samples collected at 1 foot bgs from soil borings P5-37 and P5-38 reported TPHd at concentrations of 84 and 99 mg/kg, respectively. Analysis of the soil sample collected at 5 feet bgs from monitoring well MW-5.3 reported TPHd and TPHo at concentrations of 4.5 and 28 mg/kg, respectively. Analysis of a grab ground water sample from soil boring P5-37 reported TPHd and TPHg at concentrations of 110,000 and 710 µg/L, respectively. VOC analyses of quarterly ground water samples from monitoring well MW-5.3 reported concentrations of MTBE, 1,1-DCA, cis-1,2-DCE, and naphthalene above the RL (TRC 2005).

5.5.6.3 Proposed Sampling and Analysis

Additional investigation is proposed southwest of the Tire Shop (see Figure 9) to provide supplemental data for the additional investigation west of the Mobile Equipment Shop and includes:

- One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, approximately 50 feet west of soil boring P5-37.

- One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, approximately 100 feet west of monitoring well MW-5.3.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.

  - Locations for one or two monitoring wells will be selected based on review of the ground water analytical data.

5.5.7 Log Pond East Fill Area

5.5.7.1 Background

The Log Pond (Pond 8) is located approximately 300 feet west of the Mobile Equipment Shop and has been at the site since its inception (Figure 9). Historical aerial photographs and Sanborn maps of the Log Pond Area indicate that the east end of the pond was filled over time, resulting in its current configuration. The pond was used as a log pond and later as a source of cooling water for the power plant. It also served as part of the treatment process for the scrubber effluent. The scrubber effluent was pumped to a collection pond in Parcel 7, then to an aeration pond, and finally to a fire pond that drains into the Log Pond. Storm water drainage for the City of Fort Bragg also discharges to the Log Pond (TRC, 2004a).

A geophysical survey was conducted in the Log Pond East Fill Area during the Phase II ESA in an attempt to locate buried debris. Utility lines were identified in the survey as well as potential areas of buried debris. Five potholes were advanced in the potential-debris areas to evaluate the nature of the anomalies, unearthing buried wood and some miscellaneous metal debris. Fill thickness in the potholes ranged from 2 to 14 feet (TRC 2004e).

Comparing the 1919 Sanborn map to the current site map indicates that the Log Pond's East Fill Area is larger than the previous geophysical survey's coverage area. Soil boring P5-44, completed between the Log Pond and Pond 5 during the Phase II ESA, encountered silty sand fill with trace wood debris down to 9.5 feet bgs, where refusal occurred in concrete. Soil boring P5-1 and monitoring well MW-5.6 drilling encountered silty sand fill, also to at least 9.5 feet bgs.

5.5.7.2 Previous Sampling and Analysis

Three soil borings (P5-40, P5-41, and P5-44) were completed in the Log Pond East Fill Area during the Phase II ESA (TRC, 2004b), and six potholes were excavated in July 2004 during the additional assessment by TRC (TRC, 2004e).

Soil and ground water samples were analyzed for TPHg, TPHd, TPHo, VOCs, SVOCs, PCBs, and CA Title 22 metals. Analysis of soil samples collected during the investigations reported TPHd and TPHo at maximum concentrations of 24,000 (sample P5-PH6 at 2 feet bgs) and 990 mg/kg (sample P5-TP3 at 2 feet bgs), respectively. VOCs (e.g., ethylbenzene, xylenes, naphthalene, propylbenzene, and isomers of butylbenzene) were reported in soil samples from the potholes. The maximum ground water TPHd concentration reported was 350 µg/L in a grab ground water sample from soil boring P5-40.

5.5.7.3 Proposed Sampling and Analysis

Additional investigation is proposed east of the Log Pond (see Figure 9) to assess the extent and nature of fill material and includes:

- A geophysical survey of the Log Pond East Fill Area to (1) characterize the extent of the fill area; (2) identify areas of buried metal and other debris; (3) identify areas of elevated soil conductivity that may suggest the presence of soil COPC impact. The geophysical survey will use both ground conductivity and time domain electromagnetic metal (TDEM) detector surveys. The ground conductivity survey will use the Geonics EM-31, which uses electromagnetic induction to measure the ground conductivity. The Geonics EM-61 will be used for the TDEM detector survey to detect buried metallic objects. Both instruments will be operated in automatic data acquisition mode and record data in a data logger along 10-foot-interval survey lines. Survey data locations will be obtained simultaneously using a global positioning system (GPS) unit rated to sub-meter accuracy, with the location data recorded in a data logger.

- Fifteen direct push soil borings will be advanced and continuously sampled until native material is encountered; also, grab ground water samples will be collected at each location.

  - Soil borings will be located in the area bounded by monitoring well MW-5.6, the geophysical survey area, Pond 5, and the Log Pond.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, PCBs (selected samples), dioxins and furans (selected samples), and PAHs based on field observations.

5.5.8 Former Oil House

5.5.8.1 Background

An area identified between the Log Pond and Pond 5 in the Phase I ESA was described as a former boarding house location (Figure 9). Historical maps of the area show a Former Oil House west of the former boarding house location (TRC 2004a).

The 1919 Sanborn map indicates the Former Oil House measured approximately 10 by 20 feet and was located approximately 170 feet west-southwest of the boarding house. According to the map, the center of the Former Oil House was approximately 260 feet east and 160 feet north of the southeast corner of Sawmill #1 (i.e., approximately 110 feet north-northeast of previous soil boring P5-43).

5.5.8.2 Previous Sampling and Analysis

There is no record of previous sampling and analysis at the Former Oil House.

5.5.8.3 Proposed Sampling and Analysis

Investigation is proposed in the area of the Former Oil House (see Figure 9) and includes:

- Two direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the Former Oil House.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, and PAHs.

  - Additional soil borings may be completed to further assess the extent of soil and ground water impact based on a review of the initial chemical data.

5.5.9 Former Open Refuse-Fire, Engine House, and Number 5 Shingle Mill

5.5.9.1 Background

Historical Sanborn maps show a Former Open Refuse-Fire location, a Former Engine House, and a Former Number 5 Shingle Mill located along the northeast shore of the Log Pond (TRC 2004a) (Figure 9). The RWQCB recommended investigation of these areas (RWQCB – North Coast Region 2005).

The Former Open Refuse-Fire is located approximately 185 feet south and 180 feet east of the southwest corner of Sawmill #1 building, near the north side of the berm north of the Log Pond.

The Former Engine House was located adjacent to the south side of Sawmill #1, approximately 60 feet west of the southeast building corner. The building measured approximately 85 feet north-to-south by 35 feet east-to-west. The current site map indicates that the berm north of the Log Pond bisects the former building location from northeast-to-southwest.

The 1960s facility map places the Former Number 5 Shingle House approximately 20 feet south and 60 feet west of the east end of Sawmill #1. The building measured approximately 75 feet east-to-west by 45 feet north-to-south and overlaps a portion of the Former Engine House.

5.5.9.2 Previous Sampling and Analysis

There is no record of previous sampling and analysis at the Former Open Refuse-Fire, Engine House, and Number 5 Shingle Mill Areas.

5.5.9.3 Proposed Sampling and Analysis

Investigation is proposed in the areas of the Former Open Refuse-Fire, Engine House, and Number 5 Shingle Mill (see Figure 9) and includes:

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Open Refuse-Fire Area.
  - If soil borings cannot be located within the proposed area due to equipment access restrictions, they will be relocated nearby as feasible.
- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Engine House Area north of the existing berm (the area south of the berm may be inaccessible to drilling equipment).
- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Number 5 Shingle Mill Area.
- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, dioxins and furans (selected samples at the Open Refuse-Fire Area), and PAHs.

5.6 Parcel 6

Parcel 6 AOIs consist of the following (Figure 10):

- Former Hazardous Waste Storage Area
- Planer #2
- Former Truck Shop
- Former Vehicle Maintenance Shop (Shipping Office)
- Former Diesel AST
- Log Pond West Fill Area

5.6.1 Former Hazardous Waste Storage Area

5.6.1.1 Background

The Former Hazardous Waste Storage Area is located at the northwest interior corner of Planer #2 and is noted in the site's Spill Prevention, Control, and Countermeasure (SPCC) Plan (Figure 10). The area was used for the storage of waste oil, absorbents, used paint thinners, and transformer oil and asbestos from the early 1990s through 1997, but was used for the storage of emergency response equipment at the time of the Phase I ESA (TRC 2004a).

5.6.1.2 Previous Sampling and Analysis

Three soil borings and one pothole were completed in the vicinity of the Former Hazardous Waste Storage Area during the previous investigations: soil borings P6-1 and P6-2 inside the building, and soil boring P6-17 and pothole P6-PH3 at the north exterior of the building.

Soil and ground water samples were analyzed for TPHg, TPHd, VOCs, SVOCs, and PCBs. Analysis of soil samples reported TPHd and TPHo at maximum concentrations of 810 (soil boring P6-2 at 0.5 foot bgs) and 4,600 mg/kg (pothole P6-PH3 at 1.5 feet bgs), respectively. PCBs (i.e., Aroclor-1248) were reported in one soil sample at a concentration of 0.089 mg/kg (soil boring P6-1 at 0.5 foot bgs). Soil TPHd and TPHo concentrations decreased with depth at pothole P6-PH3 as evidenced by analysis of samples collected at 1.5 feet bgs (290 mg/kg TPHd and 4,600 mg/kg TPHo) and 8 feet bgs (45 mg/kg TPHd and less than 5 mg/kg TPHo). Arsenic was reported in soil samples from pothole P6-PH3 at concentrations of 3.8 mg/kg (1.5 feet bgs) and 21 mg/kg (8 feet bgs). Analysis of a grab ground water sample from soil boring P6-1 reported TPHd at a concentration of 130 µg/L (TRC 2004b).

5.6.1.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Former Hazardous Waste Storage Area (see Figure 10) to assess the extent of PCB and petroleum impacts and includes:

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, interior of the building (near previous soil boring P6-1).

- Three soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, exterior of the building (near pothole P6-PH3).

- Soil and ground water samples will be analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, PAHs, and PCBs.

  - Additional soil borings may be completed based on chemical data from the initial soil borings.

5.6.2 Planer #2

5.6.2.1 Background

The northern portion of Planer #2 was constructed in the 1950s, and the remainder was constructed in the late 1960s to early 1970s (Figure 10). Louisiana Pacific operated Planer #2 as a plywood plant until the early 1980s, when G-P began lumber processing in the building. The building is wooden and measures approximately 600 by 800 feet with concrete and asphalt floor sections. It contained:

- Hydraulic units in the east and west portions of the building

- Stored parts (e.g., old motors, an air compressor, and transformer pieces that were observed during the Phase I ESA) and lube and hydraulic oil.

- Eight empty oil drums outside the west-central area of the building, where soil and concrete surface staining were observed (TRC 2004a)

A 1960s facility map indicates Planer #2 also contained:

- A compressor house north of the former veneer plant (northern portion of current Planer #2)

- A gasoline dispenser and UST located near the northeast corner of the former veneer plant

The RWQCB requested a subsurface evaluation of these two areas described on the 1960s facility map as well as an assessment of potential impacts from operations at the former plywood plant (RWQCB – North Coast Region 2005).

5.6.2.2 Previous Sampling and Analysis

Petroleum hydrocarbon impacts were reported in soil and ground water beneath Planer #2 during the Phase II ESA. Samples were collected and analyzed for TPHg, TPHd, VOCs, and PCBs. TPHd was reported at a maximum concentration of 180 mg/kg (exterior soil boring P6-10 at 0.5 foot bgs) in soil samples and 330 µg/L (interior soil boring P6-3) in ground water samples.

5.6.2.3 Proposed Sampling and Analysis

Additional investigation is proposed at Planer #2 to further assess the extent of COPC impacts to soil and ground water. Investigation of the former compressor house area north of the building and former UST and dispenser area northeast of the building are also proposed. The proposed investigation (see Figure 10) includes:

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, near previous soil boring P6-3 to evaluate soil and ground water impact by petroleum hydrocarbons.

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, exterior of the building north and south of soil boring P6-10 to assess the extent of soil TPHd impact.

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, north of the building in the area of the former compressor house.

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the former dispenser and UST area near the northeast building corner.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, phenol, pentachlorophenol, tetrachlorophenol, dioxins and furans (where pentachlorophenol is detected), DDAC, propiconazole, CA Title 22 meals, and PAHs.

  - Samples from the former UST and dispenser location will additionally be analyzed for TPHg.

  - Other soil boring locations may be added to the program based on a visual survey of areas containing sumps, floor cracks, surface staining, or other environmentally pertinent features.

5.6.3 Former Truck Shop

5.6.3.1 Background

The 1960s facility map depicts a Truck Shop in the southern area of Parcel 6 (Figure 10). The building is also visible in aerial photographs from 1963, 1966, 1973, and 1982. Correspondence from the RWQCB requested an investigation of the Former Truck Shop location (RWQCB – North Coast Region 2005).

Comparison of the aerial photographs with the current site map indicates that the Former Truck Shop measures approximately 20 by 30 feet and was located approximately 300 feet south-southeast of the existing Shipping Office and approximately 200 feet east-southeast of boring P6-16.

5.6.3.2 Previous Sampling and Analysis

No sampling and analysis was previously conducted.

5.6.3.3 Proposed Sampling and Analysis

Investigation is proposed of the Former Truck Shop Area (see Figure 10) and includes:

- Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Truck Shop Area.

- Soil and ground water samples will be selectively analyzed for TPHg, TPHd, TPHo, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.

- Additional soil boring locations may be added based on the analytical data from the initial three soil borings.

5.6.4 Former Vehicle Maintenance Shop (Shipping Office)

5.6.4.1 Background

The Shipping Office is a small, wooden structure constructed in the mid-1990s and located east of Planer #2 (Figure 10). It was constructed upon a pre-existing reinforced-concrete foundation that was the Former Vehicle Maintenance Shop from the early 1960s to the 1980s (portable trailers existed at the location in the interim). Surface staining was not observed at the Shipping Office during the Phase I ESA (TRC, 2004a). The Shipping Office complex also contains:

- A fuel pump near the Former Vehicle Maintenance Shop, estimated to be located near the northeast corner of the Shipping Office in the 1970s.
- A Former Oil House near the Shipping Office recommended for investigation by the RWQCB (RWQCB – North Coast Region 2005).
- A Former Number 8 Fiber Plant, measuring approximately 150 feet by 150 feet, located west of and partially overlapping the current Shipping Office.

A geophysical survey conducted in the area north and east of the Shipping Office indicated two undifferentiated utility lines traverse the area: one approximately north-to-south and the second approximately east-to-west. Two other adjacent anomalies were reported north of the Shipping Office indicating a pipe segment and an unidentified object measuring approximately 6 by 12 feet (TRC 2004b).

5.6.4.2 Previous Sampling and Analysis

Petroleum hydrocarbon impacted soil and ground water were reported in the Shipping Office Area during the Phase II ESA. Soil and ground water samples were analyzed for TPHg, TPHd, VOCs, SVOCs, PCBs, and CA Title 22 metals. Analysis of soil samples reported TPHd and TPHg at maximum concentrations of 1,200 and 7.3 mg/kg, respectively (both in soil boring P6-12 at 1 foot bgs). Concentrations of 1,3,5-TMB (0.0068 mg/kg) and arsenic (38 mg/kg) were reported in the same sample. Analysis of grab ground water samples reported TPHd at a maximum concentration of 780 µg/L (soil boring P6-14). Ground water was encountered at 5 feet bgs in soil boring P6-14 (TRC 2004b).

5.6.4.3 Proposed Sampling and Analysis

Additional investigation is proposed in the Former Vehicle Maintenance Shop (Shipping Office) Area to assess the extent of petroleum-impacted soil and ground water as well as the nature of the unidentified geophysical anomaly. The proposed sampling locations include the Former Number 8 Fiber Plant and Former Oil House identified on the 1960s facility map. The proposed investigation (see Figure 10) includes:

- The 6-by-12-foot GPR anomaly located approximately 60 feet north and 10 feet east of the northeast building corner will be excavated to assess its nature.

- Eight soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be taken, in the Former Vehicle Maintenance Shop, Oil House, and Number 8 Fiber Plant Areas.

  - Four soil borings will be advanced in the area of previous soil borings P6-12 and P6-14 to evaluate the extent of COPC soil impact reported in samples from those soil borings.

  - Two soil borings will be advanced in the area of the Former Oil House, based on the location shown on the 1960s facility map.

  - Two soil borings will be advanced in the area of the Former Number 8 Fiber Plant to investigate potential soil impact from historical operations at that facility.

- Soil and ground water samples will be selectively analyzed for TPHd, TPHg, TPHo, VOCs, PAHs, CA Title 22 metals, and ethylene glycol (selected ground water samples only).

- Additional soil borings may be advanced based on a review of the initial analytical data.

5.6.5 Former Diesel Aboveground Storage Tank

5.6.5.1 Background

According to G-P personnel, a former 25,000-gallon Diesel AST was located just east of the roadway and east of the Shipping Office (Figure 10). There was no documentation showing the mapped location of the AST in review of available historical maps and previous reports.

During the Phase II ESA, a geophysical survey approximately 150 by 150 feet in area was conducted to locate USTs and undocumented piping in the parking area approximately 200 feet east of the current Shipping Office location. No USTs were detected in the survey area, but four undifferentiated utility lines, one suspected storm drain line, and two suspected subsurface railroad spurs were reported. A terrain conductivity anomaly was also reported, indicating a change in subsurface conditions such as fill material, a change in soil moisture content, or a former building foundation (TRC 2004b).

5.6.5.2 Previous Sampling and Analysis

One soil boring (P6-15) was completed in the survey area. Analysis of the soil sample collected at 1 foot bgs reported TPHd at a concentration of 9 mg/kg (4.2 mg/kg with SGCU). TPHg was not detected in the soil sample at concentrations greater than the RL of 1.1 mg/kg.

5.6.5.3 Proposed Sampling and Analysis

Additional investigation of the Parcel 6 Former Diesel AST Area is proposed (see Figure 10) and includes:

- Four direct push borings will be advanced in a square array centered on previous soil boring P6-15 and continuously sampled to the water table, where grab ground water samples will be collected.

- Soil and ground water samples will be analyzed for TPHd, TPHo, PAHs, and CA Title 22 metals.

- Additional boring locations may be selected based on a review of the initial analytical data.

5.6.6 Log Pond West Fill Area

5.6.6.1 Background

Available historical aerial photographs indicate the Log Pond formerly extended farther west and south than its current configuration (Figure 10). The southernmost portion was filled in between 1966 and 1973, and the area between the City of Fort Bragg wastewater treatment plant and the western extent of the current Log Pond was filled in since 1982 (TRC 2004a).

5.6.6.2 Previous Sampling and Analysis

The Log Pond West Fill Area was investigated during the Phase II ESA. Eight potholes were completed as part of this investigation. One additional pothole was excavated during TRC's additional site assessment in July 2004. Fill thickness ranged from 9 to 13 feet. Wood and metal debris were observed in the potholes. Ground water was reported between 9 and 13 feet bgs with shallower seepage at 4 feet bgs.

Soil samples collected at the base of the fill were analyzed for TPHd, TPHo, SVOCs, and metals. Analysis of soil samples reported TPHd and TPHo at maximum concentrations of 310 (pothole P6-TP8 at 8 feet bgs) and 390 mg/kg (pothole P6-PH2 at 4 feet bgs), respectively. SVOC concentrations were less than the method RL. TRC recommended installation of one monitoring well near pothole P6-TP8 (incorrectly named pothole P6-PH8 in Section 5.6.9 of TRC's Phase II ESA report) to evaluate TPHd and TPHo impacts to ground water (TRC 2004b).

5.6.6.3 Proposed Sampling and Analysis

Additional investigation is proposed in the Log Pond West Fill Area. The RWQCB recommends installation of at least three ground water monitoring wells to evaluate ground water conditions and a geophysical survey to (1) characterize the extent of the fill area; (2) identify areas of buried metal and other debris; (3) identify areas of high soil conductivity suggesting COPC impact (RWQCB – North Coast Region 2005). The proposed investigation (see Figure 10) includes:

- A geophysical survey
  - A ground conductivity survey consisting of a Geonics EM-31 using electromagnetic induction to measure ground conductivity
  - A TDEM detector survey using the Geonics EM-61 to detect buried metallic objects
  - Instruments will be operated in automatic data acquisition mode and record data in a data logger along 10-foot-interval survey lines.
  - Survey data locations will be obtained simultaneously using a GPS unit rated to sub-meter accuracy, with the location data recorded in a data logger.
- Three potholes or large-diameter borings to evaluate the nature of the fill.
- Soil and ground water samples collected from these three locations and analyzed for TPHd, TPHo, VOCs, PAHs, dioxins and furans (selected samples), PCBs (selected samples), and CA Title 22 metals.
- Based on a review of the soil and ground water data, approximately three ground water monitoring wells will be screened from 5 to 15 feet bgs and continuously soil sampled to total depth during drilling to evaluate ground water conditions across the area.

5.7 Parcel 7

Parcel 7 AOIs consist of the following (Figure 11):

- Hazardous Materials Storage Area
- Former Beehive Burner and Diesel AST
- Diesel Tank, Generator, Pump, and South Ponds
- Existing Water Supply Well Abandonment
- Soil and Ash Stockpiles

5.7.1 Hazardous Materials Storage Area

5.7.1.1 Background

A Hazardous Materials Storage Area inside the Sawmill #2 building formerly contained a variety of solvents, fuels (e.g., gasoline and diesel fuel), waste-oil, hydraulic and lube oils, and paints (Figure 11). The concrete flooring in this area was reportedly stained (TRC 2004a).

5.7.1.2 Previous Sampling and Analysis

During the Phase II ESA, investigation of the Hazardous Materials Storage Areas was accomplished by advancing two soil borings (P7-1 and P7-2). Soil samples were analyzed for TPHg, TPHd, VOCs, SVOCs, and PCBs. The maximum soil-sample TPHd concentration was

210 mg/kg (soil boring P7-1 at 0.5 foot bgs). TPHg, VOCs, SVOCs, and PCBs were not detected at concentrations greater than their respective method RLs (TRC 2004b).

5.7.1.3 Proposed Sampling and Analysis

Additional investigation is proposed in the Hazardous Materials Storage Areas (see Figure 11) and includes:

- Three soil borings will be advanced east, west, and south of soil boring P7-1 and continuously sampled to the water table (anticipated at approximately 7 feet bgs), and grab ground water samples collected, to evaluate the extent of soil TPHd impact reported at soil boring P7-1.

- Soil and grab ground water samples will be selectively analyzed for TPHd, VOCs, CA Title 22 metals, and PAHs.

5.7.2 Former Beehive Burner and Diesel Aboveground Storage Tank

5.7.2.1 Background

A Beehive Burner (referred to as a TP burner in previous TRC reports) used for burning scrap materials and a Diesel AST were formerly located between Sawmill #2 and the Sorter Building to the east (Figure 11). The area also contains a chipper shaker and an oil/water separator associated with Sorter Building operations. The Diesel AST was removed in the early 1970s. There was no evidence of surface staining or environmental impacts in the area. (TRC 2004a).

A geophysical survey covering 80 by 80 feet was completed in the Former Beehive Burner and Diesel AST Areas. Metal-detector anomalies were identified, some of which were determined to be reinforced concrete. Other small anomalies were not identified. An unknown circular anomaly 12 to 15 feet in diameter may represent an AST foundation (TRC 2004b).

RWQCB requested submittal of a diagram showing the geophysical survey results in comparison with the soil boring locations in the Former Beehive Burner and Diesel AST Areas. The letter also requests further investigation of the petroleum-hydrocarbon impact to soil in the area of soil boring P7-10 (RWQCB – North Coast Region 2005).

5.7.2.2 Previous Sampling and Analysis

Four soil borings (P7-9 through P7-12) were advanced in the Former Beehive Burner and Diesel AST Areas during the Phase II ESA. Soil samples were analyzed for TPHg, TPHd, VOCs, SVOCs, and PCBs. Analysis of soil samples reported TPHd at a maximum concentration of 1,800 mg/kg (soil boring P7-10 at 0.5 foot bgs). TPHd concentration decreased with depth, as near-surface soil was impacted but soil sampled at 3 feet bgs was not. TPHd was reported at a concentration of 82 µg/L in the grab ground water sample from soil boring P7-10 (TRC 2004b).

5.7.2.3 Proposed Sampling and Analysis

Additional investigation is proposed at the Former Beehive Burner and Diesel AST (see Figure 11) to further assess the extent of petroleum hydrocarbon impacts and includes:

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, north and northwest of previous soil borings P7-10 and P7-11.

- Soil and ground water samples will be selectively analyzed for TPHd, VOCs, dioxins and furans (selected samples), CA Title 22 metals, and PAHs.

- A map plotting the findings of the geophysical survey along with the previous and new soil boring locations will be submitted with the investigation report as requested by the RWQCB.

5.7.3 Diesel Tank, Generator, Pump, and South Ponds

5.7.3.1 Background

A series of five ponds is located south of Sawmill #2, consisting of a Settling Pond (Pond 1), an Aeration Pond (Pond 2), two Holding Ponds (both designated as Pond 3), and a pond of undesignated use (Pond 4). Located north of Pond 2 are a 500-gallon Diesel AST, Generator, and Pump (used to dewater the ponds or transport water between ponds) (Figure 11). No surface staining associated with the Diesel AST or Generator was observed. (TRC 2004a).

5.7.3.2 Previous Sampling and Analysis

There were no work activities associated with the Diesel AST, pump, or generator during the Phase II ESA.

5.7.3.3 Proposed Sampling and Analysis

Investigation is proposed in the areas of the Diesel AST, Generator, Pump, and South Pond (see Figure 11) and includes:

- Three direct push soil borings (one for each feature: Diesel AST, Pump, and Generator) will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, to investigate the equipment area north of Pond 2.

  - Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, and PAHs.

- Sediment samples will be collected using two soil borings performed at each pond using the following general procedure.

- The sampling location will be land surveyed using GPS equipment.
- The water depth will be measured at each sampling location using a weighted tape measure.
- Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment.
- An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location.
- Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment thickness.
- Samples will be analyzed for VOCs, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans (selected samples), cyanide, and PCBs (selected samples).

- A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.
  - Surface water samples will be field-filtered and analyzed for CA Title 22 metals.
  - Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.

5.7.4 Existing Water Supply Well Abandonment

5.7.4.1 Background

The easternmost section of Parcel 7 contains a wooded area. Four wells were observed at the western edge of the wooded area during the Phase I ESA (Figure 11). One of the wells contained a pump connected to an aboveground polyvinyl chloride (PVC) pipeline used to transmit water to the Nursery in Parcel 9. The Phase I ESA report recommended abandonment of the wells (TRC 2004a).

5.7.4.2 Previous Sampling and Analysis

The Phase II ESA identified three wells east of Parcel 7. The total depths of wells FB-2 and FB-3 are 48 and 108 feet bgs, respectively. The total depth of well FB-1 could not be measured (TRC 2004b). Ground water samples FB-1 through FB-3 were collected from each of the three wells and analyzed for TPHd and VOCs. There were no detections of analytes at concentrations greater than the method RLs.

5.7.4.3 Proposed Sampling and Analysis

There is no available map documentation of the location of the wells proposed for abandonment. The wells will therefore be field-located prior to abandonment during implementation of the Work Plan. Abandonment of the existing wells is proposed, including:

- Inspection of each well to assess its status and condition
- Overdrilling and removal from the subsurface of well casings using hollow-stem auger equipment
- Backfilling with neat cement to the total depth of each resulting hole using a tremie pipe

5.7.5 Soil and Ash Stockpiles

5.7.5.1 Background

A 100-cubic-yard stockpile of waste soil (Soil Stockpile) resulting from UST excavation and removal was observed west of Sawmill #2 during the Phase I ESA (Figure 11). TRC recommended disposal characterization of the stockpile (TRC 2004a). An Ash Stockpile was also observed in the sediment drying area east of Pond 1 (Figure 11).

5.7.5.2 Previous Sampling and Analysis

Four soil stockpile samples were collected at the Soil Stockpile during the Phase II ESA, composited into one sample (P7-32), and analyzed for TPHg, TPHd, and metals. TPHd was reported at a concentration of 2,100 mg/kg. TPHg concentrations were less than the method RL. TRC recommended onsite treatment of the Soil Stockpile or transport and offsite disposal at an appropriate facility (TRC 2004b).

Two samples were collected at the Ash Stockpile during the Phase II ESA and analyzed for total cyanide. Cyanide concentrations were less than the method RL.

5.7.5.3 Proposed Sampling and Analysis

Additional investigation followed by offsite disposal of the Soil and Ash Stockpiles is proposed. Proposed sampling and disposal (see Figure 11) includes:

- Two samples of the Soil Stockpile.
  - Samples will be analyzed for TPHg, TPHd, VOCs, PAHs, and lead for disposal characterization.
- Two samples of the Ash Stockpile.

  - Samples will be analyzed for dioxins and furans (selected samples), PAHs, and CA Title 22 metals for disposal characterization.

- A waste disposal manifest will be completed for offsite disposal of both Stockpiles at a Class II landfill if chemical concentrations are within acceptable limits.

- A certified waste hauler will be used to transport the soil and ash to the disposal facility.

5.8 Parcel 8

Parcel 8 AOIs consist of the following (Figure 12):

- Airstrip Fueling Area
- Fill Area (Disturbance along Coastal Region)
- Clinker Piles

5.8.1 Airstrip Fueling Area

5.8.1.1 Background

The Airstrip Fueling Area is at the south end of the runway in Parcel 8 and measures 100 by 100 feet (Figure 12). The runway was constructed between 1941 and 1952 and is approximately 2,000 feet long. Transport trucks refueled airplanes directly on a pad during operation of the runway, which ceased in the late 1980s. No surface staining was observed during the Phase I ESA, though a potential for releases of fuel to the ground was noted in the report (TRC 2004a).

A geophysical survey was completed in the Airstrip Fueling Area during the Phase II ESA. The geophysical survey area measured approximately 60 feet east-to-west by 150 feet north-to-south. Two small metal detector anomalies were detected during the survey and interpreted as localized buried-metal debris (TRC 2004b).

RWQCB identified two small structures adjacent to the northeast corner of the refueling pad at the southern end of the airstrip in a 1966 aerial photograph. The southernmost building measures approximately 10 by 20 feet, and a second structure located 10 feet to 15 feet to the northeast measures less than 10 by 10 feet. These structures were east of the area of the geophysical survey and soil boring completed during the Phase II ESA. RWQCB recommended investigation of the areas of the former structures (RWQCB - North Coast Region 2005).

5.8.1.2 Previous Sampling and Analysis

One soil boring (P8-1) was completed in the Airstrip Fueling Area during the Phase II ESA and one soil sample was analyzed for TPHg, TPHd, and metals. Soil-sample analysis reported TPHd at a concentration of 8.6 mg/kg (5.6 mg/kg with SGCU) at 1 foot bgs. TPHg was not detected at concentrations greater than the method RL (TRC 2004b).

5.8.1.3 Proposed Sampling and Analysis

Additional investigation of the two former structures identified by the RWQCB in historical aerial photographs is proposed (see Figure 12) and includes:

- Two soil borings will be advanced and continuously soil sampled to the water table, where grab ground water samples will be collected, near the center of each former building (based on the locations depicted in the aerial photograph).

- Soil and ground water samples will be selectively analyzed for TPHg, TPHd, VOCs, and lead.

5.8.2 Fill Area (Disturbance Along Coastal Region)

5.8.2.1 Background

Historical photographs taken between 1957 and 1973 show a large area of vegetation and soil disturbance measuring approximately 600 by 400 feet along the coast in the southern portion of Parcel 8 (Figure 12). The photos depict an access road, which was not present during the Phase I ESA, leading to the beach below the cemetery. A 1982 aerial photograph shows the disturbed area as being re-vegetated. Historical Sanborn maps from 1919 to 1941 indicate the presence of rail lines and log-storage activities in the area. The Phase I ESA report states that there is the potential for abandoned rail lines in the area (TRC 2004a).

It should be noted that two potholes were designated "P8-PH6" by TRC in previous reports. The initial pothole P8-PH6 was excavated in the Clinker Pile Area in March 2003 during the Phase II ESA as discussed in Section 5.8.3 of this Work Plan. The second pothole P8-PH6 was excavated in the Fill Area (Disturbance Along Coastal Region) in July 2004 during the Additional Site Assessment.

5.8.2.2 Previous Sampling and Analysis

Seven potholes were excavated to between 4 and 16 feet bgs in the Parcel 8 fill area during the Phase II ESA and additional site assessments. Buried debris (i.e., wood, bark, metal shavings, and clinkers) was observed in pothole P8-T2 to 10 feet bgs, the total depth of the pothole. Tree bark was observed to 16 feet bgs in pothole P8-PH6, which was excavated during the additional site assessment (TRC 2004e). Debris was not observed in the other five potholes during the Phase II ESA (TRC 2004b).

During two separate investigations, selected soil samples were analyzed for TPHg, TPHd, TPHo, metals, and PCBs. Analysis of soil samples from pothole P8-T2 reported TPHd at a concentration of 570 mg/kg at 10 feet bgs and 1.2 mg/kg TPHd at 4 feet bgs. TPHg and PCB concentrations were less than the method RLs.

5.8.2.3 Proposed Sampling and Analysis

Additional investigation of the Fill Area is proposed (see Figure 12) and includes:

- Geophysical survey of the area to evaluate the extent of fill materials and identify potential rail lines.
  - Based on survey results, locations will be selected and excavated using a backhoe or large-diameter auger to evaluate potential geophysical anomalies and lateral and vertical fill extent.
    - Previous investigations indicate the potholes will begin in the vicinity of previous potholes P8-T2 and P8-PH6 and proceed radially outward (two potholes excavated in Parcel 8 are designated P8-PH6: one at the clinker piles excavated on March 17, 2003 for the Phase II investigation and another in the Coastal Disturbance Area excavated on July 20, 2004 for the additional site assessment).
- Potholes will be advanced and soil sampled to native material to assess vertical fill extent (ground water sampling in this area is not anticipated).
- Soil samples will be selectively analyzed for TPHd, TPHo, dioxins and furans (selected samples), CA Title 22 metals, PCBs (selected samples), VOCs, and PAHs.

5.8.3 Clinker Piles

5.8.3.1 Background

Clinker piles from wood combustion at the Powerhouse were identified in the northwest area of Parcel 8 during the Phase I ESA (Figure 12). Clinkers are lava-like pieces of rock that form when wood is burned at high temperature causing minerals in the wood to melt and fuse together—a process known as ash fusion (TRC 2004a).

5.8.3.2 Previous Sampling and Analysis

One pothole designated P8-PH6 was excavated in the Clinker Pile Area during the Phase II ESA. The soil sample collected at 1 foot bgs was analyzed for TPHd, TPHg, and CA Title 22 metals. Analysis of the soil sample reported TPHd at a concentration of 94 mg/kg and TPHg concentration at less than the method RL. Ground water was encountered at 4.5 feet bgs.

5.8.3.3 Proposed Sampling and Analysis

Additional investigation of the Clinker Piles (approximately 600 by 150 feet and 1 to 2 feet thick) is proposed (see Figure 12) and includes:

- Ten soil borings or potholes (depending on equipment accessibility) will be completed to approximately 5 feet bgs. At least one clinker and one soil sample will be collected at each location.

- Soil and clinker samples will be analyzed for dioxins and furans (selected samples), CA Title 22 metals, and PAHs.

- Evaluation of disposal and treatment options to decide the final disposition of the clinker material will be accomplished after reviewing the laboratory data.

5.9 Parcel 9

5.9.1 Background

Parcel 9 consists of the Tree Nursery, which contains the following AOIs (Figure 13):

- Five greenhouses.
  - Each measures approximately 5,000 square feet.
  - Three greenhouses constructed in 1973 and 1975 contained earthen floors until 1993, when asphalt was laid (TRC 2004a).
  - Two greenhouses were constructed with asphalt flooring (TRC 2004a).
- A main packing shed.
- A chemical storage shed.
- A pump house.
- A 9,200-gallon polyethylene holding tank.
- A water filtration and purification system.

A sump that received pesticide wastes was identified in a November 4, 1983 letter to RWQCB from Rex Timber, Inc. The letter provided a list of pesticides used at the nursery at that time. A map was enclosed that depicted the 10-by-10-by-10-foot sump as being located in a greenhouse directly east of the chemical mixing shed. A discharge line ran from the chemical mixing shed to the sump. Use of the sump ceased in 1983. Based on this information, RWQCB requested that deeper soils around the sump be assessed for potential pesticide impacts to ground water and requested that future investigations incorporate pesticides used at the Tree Nursery into their target-analyte lists (RWQCB – North Coast Region 2005).

5.9.2 Previous Sampling and Analysis

Eleven soil borings (P9-1 through P9-11) were completed to 3 feet bgs and three grab ground water samples (P9-17 through P9-19) were collected in the Tree Nursery Area during the Phase II ESA. Pesticides were reported in soil and ground water samples.

Soil sample analysis reported:

- Endosulfan I at a concentration of 0.002 mg/kg in the sample collected from soil boring P9-1 (located near the southwest corner of the greenhouse complex) at 1 foot bgs

- Aldrin at a concentration of 0.0033 mg/kg in the sample collected from soil boring P9-2 (located near the southeast corner of the greenhouse complex) at 1 foot bgs

- Dichlorodiphenyltrichloroethane (4,4-DDT) at a concentration of 0.0057 mg/kg in the sample collected from the soil boring P9-2 at 3 feet bgs

Analysis of grab ground water samples reported:

- Tebuthiuron at a concentration of 4.6 µg/L in the sample from soil boring P9-17 (located approximately 25 feet west of the chemical storage shed)

- Atrazine at concentrations of 0.77 µg/L and 4.9 µg/L in the grab ground water samples from soil borings P9-18 (located approximately 30 feet west-northwest of the water filtration and purification system) and P9-19 (located approximately 10 feet northwest of the chemical mixing shed), respectively (TRC 2004b)

Upon review of the Phase II report, the RWQCB requested additional investigation of pesticide impacts to ground water (RWQCB – North Coast Region 2005).

5.9.3 Proposed Sampling and Analysis

Additional investigation in Parcel 9 (see Figure 13) is proposed to further investigate the extent of COPC impact to ground water and includes:

- Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, to evaluate soil and ground water conditions near the sump located in the greenhouses east of the Chemical Mixing Shed.

- Seven step-out soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the perimeter of the area where pesticides were reported in soil and ground water samples.

- Soil and ground water samples will be selectively analyzed for pesticides and nitrate, as listed in Table 1.

- A phased sample analysis approach will be used to detect Nursery COPCs (Table 1) in samples collected near the sump. The results of these analyses will determine target-analyte lists for subsequent samples collected at additional locations.

5.10 Parcel 10

5.10.1 Background

A 15,000-square-foot area of Clinker and Ash/Scrap Piles was identified in the northeastern portion of Parcel 10 during the Phase I ESA (Figure 14). The clinker and ash waste materials from the Power Plant were disposed at Parcel 10 along with scrap metal from facility operations.

A geophysical survey completed as part of the Phase II ESA encompassed portions of Parcel 10 including the Clinker and Ash/Scrap piles. Anomalies identified during the survey were proposed for investigation/excavation under AME's March 21, 2005 Work Plan.

5.10.2 Previous Sampling and Analysis

During the Phase II ESA, one pothole (P10-PH2) was excavated to 12 feet bgs on the northeast side of the Clinker and Ash/Scrap Piles, which extends from 8-feet high to 1.5 feet bgs (total fill thickness of 9.5 feet). A soil sample was collected at 4 feet bgs (bottom of the pothole) and analyzed for TPHg, TPHd, VOCs, SVOCs, CA Title 22 metals, and PCBs. TPHg, TPHd, VOC, SVOC, and PCB concentrations were less than the method RLs.

One sample of the Clinker and Ash/Scrap Piles was collected by TRC in August 2004 and analyzed for PAHs, CA Title 22 metals, and SVOCs. PAHs were detected in the sample with dibenz(a,h)anthracene at a maximum concentration of 140 mg/kg. Barium was reported in the sample at a concentration of 410 mg/kg (TRC 2004e). The RWQCB requested an evaluation of the data (RWQCB – North Coast Region 2005).

5.10.3 Proposed Sampling and Analysis

Additional investigation of the Clinker and Ash/Scrap Piles and underlying soils is proposed (see Figure 14) and includes:

- Ten borings or potholes will be advanced at the piles to approximately 10 feet bgs to characterize chemical concentrations in stockpile and underlying soil samples.
  - Sample locations will be chosen randomly from a systematic grid overlay at a spacing of approximately 15 feet.
- Samples will be analyzed for TPHd, TPHo, VOCs, dioxins and furans (selected samples), PCBs (selected samples), PAHs, and CA Title 22 metals.

- Analytical data will be reviewed to evaluate options for the long-term disposition of the waste materials, which may include onsite treatment or offsite transport and disposal at an appropriate facility.

5.11 Pond 8 and Storm Drain

5.11.1 Pond 8

5.11.1.1 Background

Pond 8 (Log Pond) is the largest onsite pond and extends from near the western site boundary to the central portion of Parcel 5 (Figures 8 through 10). Surface water has been present at Pond 8 since the beginning of operations in the late 1800s. Historically, the pond was used for log storage, the scrubber-effluent treatment process, and a source of cooling water for the power plant. Records indicate that portions of the eastern boundary and western and southern ends of Pond 8 were filled. Currently the surface of the shallow pond is covered by aquatic vegetation. The pond may be accessed by small boat or foot.

5.11.1.2 Previous Sampling and Analysis

Pond 8 has received surface discharge from a storm drain and Parcels 4, 5, and 6. COPCs within the pond surface water are VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, cyanide, and Cr VI. Target analytes in the pond sediments are dioxins, furans, and PCBs.

5.11.1.3 Proposed Sampling and Analysis

Additional investigation at Pond 8 (Figures 8 through 10) is proposed. Surface water will be sampled and the full depth of sediments and fill beneath the pond will be assessed as recommended by the RWQCB (RWQCB – North Coast Region 2005). The proposed investigation includes:

- Surface water sample collection at outfall.
  - The water sample location upstream of the outfall to the ocean will be accessed by a small boat or on foot within an area where bottom sediments have not been disturbed.
  - The samples will be tested for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, cyanide, and Cr VI.
- Sediment samples will be collected using four soil borings performed at equally spaced intervals along the axis of the pond using the following general procedures.
  - The sampling location will be land surveyed using GPS equipment.
  - The water depth will be measured at each sampling location using a weighted tape measure.

- Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment.

- An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location.

- Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment thickness. Lithologic data from borings near the shoreline will be used to correlate sediment thickness and depth of nearby fill to characterize actual sediment thickness.

- Samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans (selected samples), cyanide, and PCBs (selected samples).

- A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.

  - Surface water samples will be field-filtered and analyzed for CA Title 22 metals.

  - Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.

5.11.2 Storm Drain

5.11.2.1 Background

Two storm drain pipelines enter Pond 8 from the northeast and southeast (Figure 9). These drains collect stormwater from the City of Fort Bragg storm drainage system.

5.11.2.2 Previous Sampling and Analysis

COPCs within the storm drain surface water are VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, and Cr VI.

5.11.2.3 Proposed Sampling and Analysis

Additional investigation of the Storm Drain is proposed and includes:

- Surface water sample collection.

  - If there is adequate water volume, samples will be obtained from the storm drain by immersing sampling containers directly into the water without disturbing bottom sediments. If there is inadequate water depth to immerse the containers, then water can be transferred into them from a clean sampling cup.

  - Samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, and Cr VI.

- Sediment sample collection.

  - Sediment samples can be obtained by pressing a clean stainless-steel sampling tube directly into the media to be sampled. If necessary, a slide hammer can be used to imbed the sample tube.

  - Sediment samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans, cyanide, and PCBs.

5.12 Roadways

5.12.1 Background

Historical records review failed to provide specific documentation on past practices for dust control, which may have resulted in impacts to site surface soil. Substances used for dust control may have included used motor oil or other waste oils.

5.12.2 Previous Sampling and Analysis

There is no record of any previous sampling and analysis of the roadways.

5.12.3 Proposed Sampling and Analysis

Investigation of site roadways is proposed and includes:

- A GPS survey will be conducted to verify the roadway locations and help determine sampling locations.

- Samples of surface soil will be collected at four locations judged likely for roadway dust suppression.

  - Three samples will be collected at each location at approximately 50-foot intervals along the lines of the former roadways.

  - Samples will be collected beneath existing asphalt pavement, where present, to characterize surface soils and gravel roadways that were subsequently paved.

  - Proposed locations include roadways in the following areas:

    - Finished lumber product storage (Parcel 1)

    - Vicinity of the Helicopter Pad (Parcel 2)

    - South end of the runway, near the Aircraft Fueling Area (Parcel 8)

    - Roadway between the Powerhouse and Sawmill #1 (Parcel 4)

- Soil samples will be analyzed for TPHo, VOCs, PAHs, CA Title 22 Metals, and PCBs.

5.13 Monitoring Well Installation and Ground Water Monitoring

Additional ground water monitoring is proposed. Prior to initiating drilling activities, all necessary permits will be obtained from the Mendocino County Environmental Health Department. Proposed investigation includes:

- Ground water monitoring wells will be considered at the following locations based on a review of soil and grab ground water data from initial sampling as discussed in Sections 5.1 through 5.3, 5.5, and 5.6:
    - Pump House (Parcel 1)
    - Resaw #5, Glue Lam Building, and Helicopter Pad (Parcel 2)
    - Former Planer #1 and Former Mobile Equipment Shop (Parcel 3)
    - Mobile Equipment Shop and Area West of the Mobile Equipment Shop (Parcel 5)
    - Log Pond West Fill Area (Parcel 6)
- Two sets of paired ground water monitoring wells and piezometers will be installed at the site (one set on Parcel 3 and one set on Parcel 5):
    - Monitoring wells will be screened at first-encountered ground water.
    - Piezometer soil borings will be drilled within 10 feet of the monitoring wells and installed using 8-inch-diameter hollow-stem auger equipment.
        - The piezometers will extend to the top of bedrock and are intended to provide information on vertical ground water flow conditions.
        - Soil borings will be advanced until bedrock is encountered and sampled at 5-feet-bgs intervals for logging purposes and to confirm stratigraphy encountered in the monitoring wells.
        - When the soil borings have reached total depth, 2-inch-diameter, Schedule 40 PVC casing will be installed.
        - Five feet of screen casing will be installed at the bottom of the piezometer followed by blank PVC casing to the surface.

  - The piezometer screen slot size will be 0.020 inch and the filter pack and bentonite and cement seals will be installed as described for the monitoring wells.

- Ground water monitoring wells may be planned at other locations depending on an evaluation of grab ground water sample chemistry for soil borings completed in each area.

6.0 SCHEDULE

Implementation of the scope of work presented in this Work Plan will begin within 2 weeks of RWQCB approval. Fieldwork completion during the dry season (prior to October 2005) will shorten the overall schedule duration due to better working conditions and easier work-area access. The RWQCB will be periodically informed of field-program progress to facilitate timely identification of potential delays.

7.0 REMARKS

This Work Plan represents our professional opinions, which are based in part on client-supplied and currently available information and are arrived at in accordance with accepted hydrogeologic and engineering practices at this time and location. Other than this, no warranty is implied or intended. This Work Plan was prepared solely for the use of our client. Any reliance on the information contained in the Work Plan by third parties shall be at such parties' sole risk.

8.0 REFERENCES

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TABLE 1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California
(Note: ESL, CHSSL, and other water quality criteria provided as guidance for data quality objectives.)

Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Aircraft Fueling	Aviation Gasoline	TPHg	EPA 8015	1	100	EPA 8015	50	100	
		VOCs (BTEX, alkyl-benzenes)	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		Lead	EPA 6010B	0.15	150	EPA 6020B	1	2.50	
	Aviation Turbine Fuels (Jet A)	TPHd	EPA 8015	1	100	EPA 8015	50	100	
		Naphthalene, minor BTEX	EPA 8260	0.005 for most	0.044	EPA 8260 Low Level	0.5 for most	1	Reference ESL for benzene.
Boiler coolant/ cooling towers	Corrosion inhibitors, water conditioners	Cr VI+	EPA 3060A w/ 7199	0.5	1.8	EPA 6020/ EPA 7199	1	11	**For water, If total Cr detected by 6020, then analyze samples by 7199.**
		Sodium molybdate	EPA 6010B	1	40	EPA 6020B	5	35	Analyze for molybdenum (G-P Chemical Inventory).
	Disinfectants/ Other	Didecyldimethyl-ammonium chloride (DDAC)	None	None	None	NCL (GC-MS)	5	None/ 49 (Note 8)	**Analyze select samples.** Strongly adsorbed to soil, sediment. Also used as antifungal on wood. (Listed as "dedeyldethyl" on G-P Chemical Inventory).
		Ethanol	EPA 8260	100	None	EPA 8260 Low Level	100	None/ 760,000 (Note 6)	**Add to compound list.** (G-P Chemical Inventory).
		Isopropanol	EPA 8260	100	None	EPA 8260 Low Level	100	None/ 160,000 (Note 6)	**Add to compound list.** (G-P Chemical Inventory).
Boiler feed water	Water conditioners, scale removal	Trisodium nitrilotriacetate monohydrate (Nitrilotriacetate, trisodium monohydrate)	None	None	None	GC / MS	-	None/3.5 (Note 5)	**Analyze select samples.** See also nitrilotriacetic acid and its salts. (G-P Chemical Inventory).

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			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Boiler fueling and operation	Bunker C, residual fuel	TPHo	EPA 8015	1	500	EPA 8015	300/ 78	100	Water TPHo report to MDL of 78.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzon(a,h) anthracene water)
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)
	Motor oil, used	TPHo	EPA 8015	1	500	EPA 8015	300/ 78	100	Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)
	Bottom ash waste, may include clinker	PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		Dioxins and furans	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze select samples where ash, maximum PAH concentrations present.** ESL and MDL provided for 2,3,7,8-TCDD
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Compressors	Compressor oil	TPHo	EPA 8015	1	500	EPA 8015	300/ 78	100	Water TPHo report to MDL of 78.
Explosives Storage at Explosives Bunker, Parcel 1	Explosives (Dynamite and Ammonium Nitrate)	Nitroglyerine (trinitroglycerol)	EPA 8332	-	None	EPA 8332	-	None/ 2 (Note 9)	
		Nitrate, as N	EPA 300.0	0.5	None	EPA 300.0	50	None/ 10,000 (Note 12)	
Fiber Plant (Parcel 6)	Wood fiber. May also include additives such as rosin, alum, asphalt, paraffin, natural and synthetic resins.	Paraffin and asphalt as TPHd, TPHo.	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Water TPHo report to MDL of 78. No specific data on synthetic resin use.
Glu-Lam	Phenol-resorcinol formaldehyde resin, resorcinol-formaldehyde resin, and/or phenol-formaldehyde resin	Phenol	EPA 8270	0.33/ 0.03	0.08	EPA 8270	10/ 0.5	5	Report to MDL. Most resins supplied in liquid form, with hardener added to resorcinol resins. Curing temperature varies by formula from room temperature to 275 F. (USDA, Eckelman)
		Resorcinol	EPA 8270	-	None	EPA 8270	100/	None/ 30 (Note 2)	**Add to compound list.** (C&T 8270 added compound.)
		Formaldehyde	NA	NA	None	NA	NA	None	Unstable in water (ATSDR)
	Urea-formaldehyde resin	Formaldehyde	NA	NA	None	NA	NA	None	Unstable in water (ATSDR)

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Lumber Surface Treatment at Planers (and potentially Green Chain) and Parcel 1	Pentachlorophenol, technical grade	Pentachlorophenol	EPA 8270	0.67	4.41	EPA 515.1	0.1	1	(DEQ, reference for PCP use)
		Tetrachlorophenol	EPA 8270	-	None	EPA 8270	10/-	None/ 1 (Note 1)	**Add to compound list.** (C&T 8270 added compound.) Present at aproximately 4 percent (ATSDR).
		Dioxins and furans	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze where pentachlorophenol detected.** Present at parts per thousand levels (ASTDR). ESL and MDL provided for 2,3,7,8-TCDD
	Fungicide	Didecyldimethyl-ammonium chloride (DDAC)	None	None	None	NCL (GC-MS)	5	None/ 49 (Note 8)	**Analyze select samples.** Strongly adsorbed to soil, sediment. Also used in cooling tower. (Listed as "dedeyldethyl" on G-P Chemical Inventory).
		Propiconazole (Banner)	NA	NA	None	NCL	5	None/ 91 (Note 3)	(RWQCB)
Lumber Treatment at Dip Tanks	Pentachlorophenol, technical grade	Pentachlorophenol	EPA 8270	0.67	4.41	EPA 515.1	0.1	1	
		Tetrachlorophenol	EPA 8270	-	None	EPA 8270	10/-	None/ 1 (Note 1)	**Add to compound list.** (C&T 8270 added compound.) Present at aproximately 4 percent (ATSDR).
		Dioxins and furans	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze where pentachlorophenol detected.** Present at parts per thousand levels (ASTDR). ESL and MDL provided for 2,3,7,8-TCDD

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Machinery routine maintenance at sawmills, planing mills, sorting mills, debarkers, chippers, etc.	Hydraulic oils and machine lubricants; petroleum solvents	TPH as stoddard, napththa solvents (petroleum-based solvents in range of TPHd); TPH as lubricants (in range of TPHo)	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Analyze as TPHd, TPHo. Water TPHo report to MDL of 78.
	Chlorinated solvents, paint solvents	VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
Maintenance Shops; Including Electrical, Machine, Plumbing and Sheet Metal Shops, and Plant Supply	Degreasers, parts cleaners, solvents, paint thinners, cutting oil, hydraulic oil, other lubricants	TPH as kerosene, stoddard, napththa solvents (petroleum-based solvents in range of TPHd); TPH as cutting oils, lubricants (in range of TPHo)	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Analyze as TPHd, TPHo. Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
	Electrical component dielectric fluid	PCBs, individual congeners	EPA 8082	0.012	0.22/ 0.089	EPA 8082	0.5/ 0.01 to 0.025	0.014	Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.
	Metals and metal anticorrosion paints	CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Motor Vehicle Fueling	Gasoline	TPHg	EPA 8015	1	100	EPA 8015	50	100	
		VOCs (BTEX, alkyl-benzenes, EDB, DCE)	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		Lead	EPA 6010B	0.15	150	EPA 6020B	1	2.50	
	Diesel	TPHd	EPA 8015	1	100	EPA 8015	50	100	
		BTEX	EPA 8260	0.005 for most	0.044	EPA 8260 Low Level	0.5 for most	1	Reference ESL for benzene.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
Motor Vehicle Maintenance	Gasoline, diesel, used motor oil, hydraulic oil, degreasers	TPHg	EPA 8015	1	100	EPA 8015	50	100	
		TPHd, TPHo	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)
	Antifreeze	Ethylene glycol	NA	NA	None	EPA 8015	5000	14000 (Note 4)	**Limited ground water sampling at selected locations.** Highly soluble in water, leachable, and biodegradable (ASTDR).

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Nursery	Fertilizer	Nitrate, as N	EPA 300.0	0.5	None	EPA 300.0	50	None/ 10,000 (Note 12)	
	Pesticides (Note: Anayze initial samples at sump, etc. for full list. Select subset for further analysis based on concentrations and screening levels)	Banrot 40-WP (etridiazole)	NCL	0.02	None	NCL	-	None	Fungicide (RWQCB, G-P Chemical Inventory) See also Truban
		Benlate WP (benomyl)	None	NA	None	EPA 402	100	None/ 350 (Note 3)	Fungicide (RWQCB)
		Captan 50-WP (captan)	None	NA	None	EPA 632M	5	None/ 1.5 (Note 4)	Fungicide (RWQCB, G-P Chemical Inventory)
		Chipco 26019 (iprodione)	None	NA	None	EPA 632M	1	None/ 280 (Note 3)	Fungicide (G-P Chemical Inventory)
		Daconil 2787 (chlorothalonil)	EPA 8081M	0.1	None	AB 1803	0.1	None/ 1.5 (Note 9)	Fungicide (RWQCB)
		Dithane M-45 (ziram)	EPA 630M	0.5	None	EPA 630	5	None/ 87.5 (Note 10)	Fungicide (RWQCB)
		Subdue 2E (Apron, Metalaxyl)	None	NA	None	EPA 632M	10	None/ 420 (Note 3)	Fungicide (G-P Chemical Inventory)
		Truban (etridiazole)	NCL	0.02	None	NCL	-	None	Fungicide (RWQCB) See also Banrot
		Aldrin	EPA 8081A	0.02	0.032/ 0.033	EPA 508	0.01	0.002	Insecticide (Reported in previous sampling)
		DDT (dichlorodiphenyl-trichloroethane)	EPA 8081A	0.02	1.62/ 1.6	EPA 8081A	0.1	0.001	Insecticide (Reported in previous sampling)
		Endosulfan I	EPA 8081A	0.02	0.0046	EPA 8081A	0.1	0.0087	Insecticide (Reported in previous sampling) ESLs are for Endosulfan, n.o.s.
		Diazinon	EPA 8141A	0.5	None	EPA 8141A	0.5	None/ 0.6 to 14 (Note 10)	Insecticide (RWQCB)

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			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Nursery - continued	Pesticides - continued	Malathion	EPA 8141A	0.5	None	EPA 8141A	0.5	None/ 0.34 (Note 11)	Insecticide (RWQCB)
		Atrazine	EPA 619M	1	None	EPA 619	0.5	1 (Note 12)	Herbicide (Reported in previous sampling)
		Garlon 3A and 4 (triclopyr)	EPA 8151A	1	None	EPA 8151M	1	None	Herbicide (G-P Chemical Inventory)
		Roundup (glyphosate)	NCL	0.05	None	EPA 547	5	None/ 700 (Note 12)	Herbicide (RWQCB and G-P Chemical Inventory)
		Spike 80W (tebuthiuron)	NCL	0.2	None	NCL	2	None/ 490 (Note 3)	Herbicide (G-P Chemical Inventory, also reported in previous sampling)
Open burning, including Beehive burners	Ash with byproducts of wood or mixed debris combustion	PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		Dioxins and furans	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze select samples where ash, maximum PAH concentrations present.** ESL and MDL provided for 2,3,7,8-TCDD
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)
Plywood Plant (Parcel 6)	Phenol-formaldehyde resin	Phenol	EPA 8270	0.33/ 0.03	0.08	EPA 8270	10/ 0.5	5	Report to MDL. Most resins supplied in liquid form. Curing temperature varies by formula from room temperature to 275 F. (USDA, Eckelman)
		Formaldehyde	NA	NA	None	NA	NA	None	Unstable in water (ATSDR)
	Urea-formaldehyde resin	Formaldehyde	NA	NA	None	NA	NA	None	Unstable in water (ATSDR)

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			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Ponds	Runoff from other areas with dissolved COPCs and sediments	VOCs (water)	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		TPHg	EPA 8015	1	100	EPA 8015	50	100	
		TPHd, TPHo	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Water TPHo report to MDL of 78.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)
		Cyanide	EPA 9010B	1	(0.0036 for free cyanide)	EPA 9010B or 335.4	10 or 5	(1 for free cyanide)	(RWQCB Orders 94-110, R-2001 0022)
		Cr VI+	EPA 3060A w/ 7199	0.5	1.8	EPA 6020/ EPA 7199	1	11	**For water, If total Cr detected by 6020, then analyze samples by 7199.**
		Dioxins and furans (sediments)	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze select sediment samples where ash/waste oil, maximum PAH concentrations present.** ESL and MDL provided for 2,3,7,8-TCDD
		PCBs, individual congeners (sediments)	EPA 8082	0.012	0.22/ 0.089	EPA 8082	0.5/ 0.01 to 0.025	0.014	**Analyze select sediment samples where ash/waste oil, maximum PAH concentrations present.** Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.

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Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Power distribution - transformers	Transformer cooling oil	PCBs, individual congeners	EPA 8082	0.012	0.22/ 0.089	EPA 8082	0.5/ 0.01 to 0.025	0.014	Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.
Power generation	Turbine oil, hydraulic oil, machine lubricants, petroleum solvents	TPHd, TPHo	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
Roadway dust control	Possible use of used motor oil/ waste oil for dust supression (not specifically documented)	TPHo	EPA 8015	1	500	EPA 8015	300/ 78	100	**Sample at representative subset of roads.** Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	**Sample at representative subset of roads.** Reference ESL for DCE (1,2-DCA) rather than EDB.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	**Sample at representative subset of roads.** Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	**Sample at representative subset of roads.** (ESL mins for thallium soil and cadmium water)
		PCBs, individual congeners	EPA 8082	0.012	0.22/ 0.089	EPA 8082	0.5/ 0.01 to 0.025	0.014	**Sample at representative subset of roads.** Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.

TABLE 1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California
(Note: ESL, CHSSL, and other water quality criteria provided as guidance for data quality objectives.)

Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Waste Fill	May possibly include log deck scrapings, bottom ash waste, clinker, fly ash, burn debris, waste diesel, motor oil, solvents.	TPHd, TPHo	EPA 8015	1	100	EPA 8015	50 to 300/ 78	100	Water TPHo report to MDL of 78.
		VOCs	EPA 8260	0.005 for most	4.48E-03	EPA 8260 Low Level	0.5 for most	0.5	Reference ESL for DCE (1,2-DCA) rather than EDB.
		PAHs	EPA 8270	0.067/ 0.01	0.038	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	8.54E-03	Report to MDL. (ESL mins for benzo(a)pyrene soil and dibenzo(a,h) anthracene water)
		Dioxins and furans	EPA 8290	1.00E-06	4.62E-06	EPA 8290	1.00E-05	5.00E-06	**Analyze select samples where ash/waste oil, maximum PAH concentrations present.** ESL and MDL provided for 2,3,7,8-TCDD
		PCBs, individual congeners	EPA 8082	0.012	0.22/ 0.089	EPA 8082	0.5/ 0.01 to 0.025	0.014	**Analyze select samples where ash/waste oil, maximum PAH concentrations present.** Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.
		CA Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	1	EPA 6020B	0.25 to 1	1.10	(ESL mins for thallium soil and cadmium water)

TABLE 1

SELECTION OF CHEMICALS OF POTENTIAL CONCERN
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California
(Note: ESL, CHSSL, and other water quality criteria provided as guidance for data quality objectives.)

Process	Substances Used or Waste Products	COPCs	Soil		Min ESL / CHHSL (mg/kg)	Water		Min ESL / Other (µg/L)	Notes
			Method	RL/MDL (mg/kg)		Method	RL/MDL (µg/L)		
Water treatment	Alum	Aluminum	NA	NA	None	EPA 6020B	0.25 to 1	87 (Note 7)	Analyze in water.

Notes

Boldface added to some notes for emphasis.

1. Water criterion for tetrachlorophenol of 1 µg/L is US EPA ambient water quality criterion for taste / odor and California Ocean Plan for chlorinated phenols.

2. Water criterion for resorcinol of 30 µg/L is California Ocean Plan for nonchlorinated phenols.

3. EPA IRIS reference dose for drinking water.

4. CA DHS action level for drinking water.

5. CA EPA cancer potency factor as drinking water level.

6. Taste and odor threshhold.

7. Water citerion for aluminum is US EPA ambient water quality criterion for freshwater aquatic habitat, 4-day average.

8. Water criterion NOEL Daphnia magna (WWPI, 2001)

9. US EPA drinking water health advisory or SNARL

10. US EPA/ NAS drinking water health advisory or SNARL, non-cancer.

11. US EPA ambient water quality criterion for saltwater aquatic habitat, 1-hour average.

12. CA EPA Primary MCL.

µg/L = microgram(s) per liter
ATSDR = Agency for Toxic Substances and Disease Registry
BTEX = benzene, toulene, ethylbenzene, xylenes
C&T = Curtis & Tompkins, Ltd.
CHHSL = California Human Health Screening Levels
COPC = chemical(s) of potential concern
Cr = chromium
DCA = dichloroethane
DCE = dichloroethene
DDAC = didecyldimethyl- ammonium chloride
DEQ = Department of Environmental Quality, State of Oregon
DHS = Department of Health Services
DTSC = Department of Toxic Substances Control
EDB = ethylene dibromide
EPA = United States Environmental Protection Agency
ESL = Environmental Screening Level
F = degrees Farenheit
GC = gas chromatograph
G-P = Georgia Pacific
IRIS = Integrated Risk Information System
MCL = maximm contaminant level
MDL = method detection limit
mg/kg = milligram(s) per kilogram
MS = mass spectometry
NAS = National Academy of Sciences
NCL = North Coast Laboratories, Ltd.
NOEL = No Observable Effect Level
OEHHA = Office of Environmental Health Hazard Assessment
PAH = polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
PCP = pentachlorophenol
RL = Reporting Limit
RWQCB = Regional Water Quality Control Board
SNARL = Suggested No Adverse Response Level
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin
TPH = total petroleum hydrocarbon(s)
TPHd = total petroleum hydrocarbon(s) as diesel
TPHo = total petroleum hydrocarbon(s) as motor oil
USDA = United States Department of Agriculture
VOC = volatile organic compound
WWPI = Western Wood Preservers Institute

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
1	2003	74-86-2	Acetylene	Acetylene	Cylinder	125 Cu.Ft.	3,820	4,750		3, 6, 7	Machine Shop, Sheet Metal, Plumbing and Plant Store, and Mobile Equipment Shop, East Wall, DWG-4 and 5. Northwest corner and south central areas of Saw Mill #2, DWGs-11 and 12. Located in norhteastern section of the Construction / Engineering Building, DWG-17.	
2	2003	7757-83-7	Sodium sulfite/ Adjunet SS-Cal	Adjunet (Formula) SS-Cal	Steel Drum	400 lbs.	600	800		4	Located in southwest corner of Power House, DWG-9.	
3	2003	007-440-371	Argon (Welding Gas)	Argon	Cylinder	330 Cu.Ft.	562	1,179		5	Not listed on G-P map. G-P grid places it in the Mobile Equipment Shop and the Lins Office, DWG-5.	
4	2003	7681-52-9, 7782-50-5	Sodium Hypochloride	Bleach	Tank Inside Bldg.	1,300 Gal.	1,300	2,100		4	Not listed on G-P map. DWG-10 lists Chemical Storage Tanks at eastern end of Cooling Towers and at SW corner of the Power House.	
5	2003	1310-73-2	Sodium Hydroxide	Caustic Soda (NaoH)	Plastic Drum	500 Gal.	1,500	2,500		4	Tanks located in west-central area and along the northern wall of the Water Treatment Plant's westernmost building, DWG-15.	
6	2003	68476-34-6	Diesel #2	Diesel #2	AST	20,000 Gal.	9,000	20,000		1, 5, 7	South of Equipment Shop and southwest of Washdown and Separator Area. West of Woods Office, DWG-3. On north shore of Pond #2 (South Pond Pump House), DWG-16. Located north of the Helicopter Landing Pad at the Pump House for Pond #9 (North Pond), DWG-18.	
7	2003	7631-95-0	Sodium Molybate	Formula 222	Steel Drum	250 Gal.	150	250	Sodium Hydroxide 10% Zinc Sulfate 5%	4	Northeast corner of Cooling Towers, DWG-9.	

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SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
8	2003	1310-73-2	Sodium Hydroxide 10%	Formula 222-I	AST	330 Gal.	200	330	Sodium Hydroxide 10%			
9	2003	67-63-0	Isopropyl Alcohol 45%, Isopropanol	Formula 255	AST	250 Gal./ 330 Gals.	150	250	Isopropyl Alcohol 45%	4	Northeast corner of Cooling Towers, DWG-9.	
10	2003	1310-73-2	Sodium Hydroxide	Formula 291	Plastic Drum	275 Gal.	275	275		4	South approximately 90 feet of southwest corner of Power House, DWG-9.	
11	2003	64-17-5, 7173-51-5	Alcohol Ethyl 50% and Ammonium Chloride Didecyldiethly	Formula 35	Steel Drum	35 Gal.	20	35	Didecyl-diethyl Ammonium Chloride 25% Ethyl Alcohol 50%	4	Northeast corner of Cooling Towers structure, DWG-9.	
12	2003	108-16-7	N,N- Dimethyl-isopropanol-amine	Formula 42NF	Plastic Drum	330 Gal.	250	500		4	South approximately 90 feet of southwest corner of Power House, DWG-9.	Excluded as COPC; screening level for diethanolamine as surrogage 22,000,000 taste and odor.
13	2003	188-16-7	Diethylamino-Proponal	Formula 42NF	Steel Drum	275 Gal.	250	500		4	South approximately 90 feet of southeast corner of Power House, DWG-9.	Excluded as COPC; screening level for diethanolamine as surrogage 22,000,000 taste and odor.
14	2003	67989-16-6	Alcohol Alkoxylated	Formula 65	Steel Drum	5 Gal.	4	5	Alkoxylated Alcohol 10%	4	Northeast corner of Cooling Towers structure, DWG-9.	Excluded as COPC due to minimal quantities used.
15	2003	18662-53-8	Trisodium Nitrilotriacetate Monohydrate	Formula 94	Plastic Drum	1,250 lbs.	1,250	1,500	Trisodium Nitrilo-triacetate, Monohydrate 98%	4	Southwest corner of Power House, DWG-9.	
16	2003		Heating Oil/ RS 300 Residual Fuel	Fuel Oil	ASTs w/in Secondary Containment Structure	10,000 Gal.	15,000	30,000		4	Located in large secondary containment structure to the north of the Fuel Storage House and south of Water Tower. MW-4.1 nearby, DWG-8.	

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
17	2003	8006-61-9	Gasoline	Gasoline	AST	12,000 Gal.	6,000	12,000		5	South of Equipment Shop and southwest of Washdown and Separator Area. West of Woods Office, DWG-3.	
19	2003	64742-65-0, 63449-39-7, 64742-62-7, 64742-47-8	Solvent Dewaxed Dist. Chlorinated Paraffins Oil	Kool Kut II HD	Steel Drum	200 Gal.	400	1,000	Solvent Dewaxed Dist. 92%, Chlorinated paraffins 2%, Oil 2%	3	55-gallon drum on north side of Machine Shop, DWG-4.	
20	2003		Oil Crankcase	Oil Crankcase	Steel Drum	7,000 Gal.	6,560	7,535		3, 5	South of Equipment Shop, Southwest of Washdown and Separator Area, and West of Woods Office, DWG-3. Area just north of Machine Shop, DWG-4. Beneath Saw Mill #2 in a special storage room are 7- to 55-Gal. drums, DWG-11.	
21	2003	64742-65-0	Oil Hydraulic	Oil Hydraulic	AST	1077 Gal.	7,230	8,053		6, 7	Located on west side, central and east-central areas of Planing Mill #2, DWG -7. South and western walls and beneath Saw Mill #2 (west wall) in a special storage room are 7- to 55-Gal. drums, and two 775 Gal. units northwest of "Bark Pile," DWG-11. Three units located down the center axis of the Sortor Building, DWG-13	
22	2003	7782-44-7	Oxygen	Oxygen	Cylinder	281 Cu.Ft.	7,050	9,682		3, 6, 7	Machine Shop, Sheet Metal/Plumbing/Plant Store, and Mobile Equipment Shop East Wall West of Planing Mill #2 DWG-4, 5, and 6. Northwest corner and south-central area of Saw Mill #2, DWGs-11 and 12. Located in northeastern section of the Construction/Engineering Building, DWG-17.	

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
23	2003		Latex/Enamel Paint	Latex/Enamel Paint	Plastic Drum	300 Gal.	700	900		3, 6	Located in the west-central area along the western wall in the Construction / Engineering Building, DWG-17. Southeastern section of Planing Mill #2 Building, DWG-7.	
24	2003	1330-20-7	Xylene Vmp Naphtha	Paint Thinner	Steel Drum	55 Gal.	55	110		3	Stored in portable shed, approximately 90 feet to the west of Construction / Engineering Building, DWG-17.	
25	2003	74-98-6	Propane	Propane	AST, Cylinders	8,600 Cu.Ft.	4,335	8,675		4, 5	Two 75-Cu.Ft. bottles located south approximately 25 feet from center section of Power House. AST located on east side of Fuel Storage and Dispensing Area, which is south of Equipment Shop and southwest of Washdown and Separator Area. West of Woods Office. DWGs 3 and 9.	
26	2003	497-19-8	Sodium Carbonate 50%	Soda Ash	AST	250 Gal.	150	250	Sodium Carbonate 50%	4	Located in central area of the most western building of the Water Treatment Plant, DWG-15.	
27	2003	64742-47-8	Petroleum Solvent	Solvent	Tank Inside Bldg.	80 Gal.	160	215	Distillates (petroleum) hydrotreated light 100%	3 , 5, 6, 7	Area just north of Machine Shop, DWG-4. Southwest and northeast corners of Mobile Equipment Shop, DWG-5. Central section of Planing Mill #2, DWG-7. 15-Gal. container located in central area of Power House, DWG-9. 10- and 15-Gal. containers located in western area of Saw Mill #2, DWGs-11 and 12.	
28	2003	7664-93-9	Sulfuric Acid	Sulfuric Acid	Plastic Drum	330 Gal.	250	330		4	Northeast corner of Cooling Towers, DWGs-9 and 10.	
29	2003	64740-65-0	Solvent Dewaxed Distillate Heavy Paraffin	Turbine Oil	AST	910 Gal.	1,700	2,340		4	North central area of Power House beneath floor grating between east and west turbines, DWGs-9 and 10.	

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
30	2003		Waste Oil	Waste Oil	Steel Drum	4,000 Gal.	1,040	4,110		4, 5	Fuel Dispensing area, westernmost tank. South of Equipment Shop, DWG-3. North Shed of Mobile Equipment Shop, DWG-5. Approximately 130 feet north of Power House, DWGs-9 and 10.	
31	1999	7782-50-5	Chlorine	Chlorine Gas	Cylinder	540 Cu.Ft.	1,900	3,780		4	South approximately 20 feet from central area of Power House, DWGs-9 and 10. Far western wall of most western building of the Water Treatment Plant, DWG-15.	
32	1999	111159	Ethylene Glycol	Antifreeze	Not listed	55 Gal.	25	55		5	Located in northern shed of the Mobile Equipment Shop, DWG-5.	
33	1999	1344-28-1	Aluminum Oxide	Liquid Aluminum	Poly Tank	4,000 Gal.	2,500	4,000		4	Located in a tank approximately 300 feet northwest of the westernmost building of the Water Treatment Plant, DWG-15.	
34	1998		No Hazardous Components Listed	Formula 21-CC	Not Listed	200 lbs.	400	1,000		4	Along the northern wall of the westernmost building of the Water Treatment Plant, DWG-15.	
35	1998		No Hazardous Components Listed	Cimcool	Drum Type not listed	55 Gal.	40	55		3	Area just north of Machine Shop, DWG-4.	
36	2003	5064-31-3	Formula 94/ Formula 42 Mixture			750 lbs.				4	Southwest corner of Power House, DWG-9.	
37	2003	67989-15-6	Formula 65 Polyalkoxylated Ether			30 Gals.				4	Northeast corner of Water Cooling Towers, DWG-9.	Excluded as COPC due to minimal quantities used.
38	2003		Aluminum Sulfate			5,000 Gals.				4	Not shown on G-P map.	
39	2003		Aluminum Sulfate and Water			250 Gals.				4	Not shown on G-P map.	
40	2003			Formula SS CAT		800 lbs.				4	Southwest corner of Power House, DWG-9.	

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
41	2003			Automatic Transmission Fluid		55 Gal.				4	Northeastern section of Power House, DWG-9.	
42	2003			Lube Oil	Not Listed	7,000				3, 4, 5, 6	Northern tank in Fuel Dispensing Area, south of Equipment Shop, DWG-3. Area just north of Machine Shop, DWG-4. North and West Sheds of Mobile Equipment Shop, DWG-5. Central Area of Planing Mill #2, DWG-7. Two 140-Gal. units northwest of "Bark Pile," and beneath Saw Mill #2 in "special storage room," DWG-11.	
43	2003			Brake Grease	Not Listed	Not Listed				4	West central area of Power House, DWG-10.	
44	2003			Way Oil	Not Listed	315 Gal.				7	Located in western area of Saw Mill #2, DWG-11	
45	2003			Empty Oil Drum Storage	Size of drums not listed					7	Southwest corner of Saw Mill #2, DWG-12	
46	2003		Topsen M3336WP, Chipco 26019, Subdue 2E, Banot 40WP, Captan 50W.	Fungicides	NL	NL	NL	NL		9	Materials would be stored on temporary basis and none for any length of time in the two sheds. Located in two storage sheds, one in the center of the west wall of the Tree Green-House. The second shed is approximately 90 feet northwest of the Nursey Main Shed, DWG-14	Topsen eliminated as COPC; no screening level or analytical method.
47	2003		Orthese M.	Insecticide						9	Materials would be stored on temporary basis and none for any length of time in the two sheds. Located in two storage sheds, one in the center of the west wall of the Tree Green-House. The second shed is approximately 90 feet to the NW of the Nursey Main Shed, DWG-14	Eliminated as COPC; no screening level or analytical method.

TABLE 2

SUMMARY OF HAZARDOUS MATERIALS INVENTORY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Item #	Inventory Date	CAS Number	Chemical Name	Common Name	Storage Container	Largest Container	Ave. Daily Use	Max. Daily Use	Hazardous Component %WT.	Parcel Number	Building Location, and Emergency Response Plan Sheet (DWG)[1]	Notes
48	2003		Garlon 3A and 4, Roundup, Spike 80W, Amitrol T.	Herbicides						9	Materials would be stored on temporary basis and none for any length of time in the two sheds. Located in two storage sheds, one in the center of the west wall of the Tree Green-House. The second shed is approximately 90 feet northwest of the Nursery Main Shed, DWG-14.	Amitrol T. eliminated as COPC; no standard analytical method.

Notes

1. Area names in this column refer to specific labels used in Emergency Response Plan Sheets.

Chemicals indicated with an inventory date of 1998 or 1999 are those without a listing in the 2003 inventory.

Jet Fuel was once stored in northern most 10,000-gallon AST in Power House Fuel Storage Area. Later replaced with RS300 Reserve Fuel Oil, Parcel 4 DWG-8. Last known reference is August 16, 1988.

%WT = percent of weight
AST = aboveground storage tank
Bldg = building
CAS = Chemical Abstracts Service
Cu.Ft. = cubic feet
DWG = Drawing
Gal. = gallons
G-P = Georgia Pacific
lbs. = pounds
NaoH = Sodium Hydroxide
NL = not listed

TABLE 3

SAMPLE ANALYTICAL PARAMETERS
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Chemical Class or Individual COPC	Chemical Class or COPC Full Name	Soil		Water		Notes
		Method	RL/MDL (mg/kg)	Method	RL/MDL (µg/L)	
Chemical Class						
TPHg	Total Petroleum Hydrocarbons - gasoline	EPA 8015	1	EPA 8015	50	
TPHd, TPHo	Total Petroleum Hydrocarbons - diesel and motor oil	EPA 8015 Cleanup EPA 3630C	1	EPA 8015 Cleanup EPA 3630C	50 to 300/ 78	Water TPHo report to MDL of 78. Analysis with silica gel cleanup.
VOCs, including Ethanol and Isopropanol	Volatile Organic Compounds	EPA 8260	0.005 for most	EPA 8260 Low Level	0.5 for most	Add ethanol and isopropanol to compound list at boiler process areas (see Table 1).
PAHs	Polynuclear Aromatic Hydrocarbons	EPA 8270	0.067/ 0.01	EPA 8310	0.1 to 0.2/ 0.01 to 0.05 for most	Report to MDL.
Dioxins and furans	Dibenzodioxins and Dibenzofurans, chlorinated	EPA 8290	1.00E-06	EPA 8290	1.00E-05	MDL provided for 2,3,7,8-TCDD
PCBs, individual congeners	Polchlorinated Biphenyls, individual congeners	EPA 8082	0.012	EPA 8082	0.5/ 0.01 to 0.025	Report water samples to MDL. Analyze for congeners rather than Arochlor ranges.
CA Title 22 Metals	California Title 22 Metals	EPA 6010B/ 7400	0.15 to 1	EPA 6020B	0.25 to 1	
Individual COPCs						
Aldrin	-	EPA 8081A	0.02	EPA 508	0.01	Insecticide
Atrazine	-	EPA 619M	1	EPA 619	0.5	Herbicide
Banrot 40-WP (etridiazole)	-	NCL	0.02	NCL	-	Fungicide; See also Truban
Benlate WP (benomyl)	-	None	NA	EPA 402	100	Fungicide

TABLE 3

SAMPLE ANALYTICAL PARAMETERS
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Chemical Class or Individual COPC	Chemical Class or COPC Full Name	Soil		Water		Notes
		Method	RL/MDL (mg/kg)	Method	RL/MDL (µg/L)	
Captan 50-WP (captan)	-	None	NA	EPA 632M	5	Fungicide
Chipco 26019 (iprodione)	-	None	NA	EPA 632M	1	Fungicide
Chromium VI+	Hexavalent Chromium	EPA 3060A w/ 7199	0.5	EPA 6020/ EPA 7199	1	
Cyanide	-	EPA 9010B	1	EPA 9010B or 335.4	10 or 5	
Daconil 2787 (chlorothalonil)	-	EPA 8081M	0.1	AB 1803	0.1	Fungicide
DDT (dichlorodiphenyl-trichloroethane)	-	EPA 8081A	0.02	EPA 8081A	0.1	Insecticide
Diazinon	-	EPA 8141A	0.5	EPA 8141A	0.5	Insecticide
Didecyldimethyl-ammonium chloride (DDAC)	-	None	None	NCL (GC-MS)	5	Strongly adsorbed to soil, sediment.
Dithane M-45 (ziram)	-	EPA 630M	0.5	EPA 630	5	Fungicide
Endosulfan I	-	EPA 8081A	0.02	EPA 8081A	0.1	Insecticide
Ethylene glycol	-	NA	NA	EPA 8015	5000	Highly soluble in water, leachable, and biodegradable .
Garlon 3A and 4 (triclopyr)	-	EPA 8151A	1	EPA 8151M	1	Herbicide
Malathion	-	EPA 8141A	0.5	EPA 8141A	0.5	Insecticide
Nitrate, as N	-	EPA 300.0	0.5	EPA 300.0	50	

TABLE 3

SAMPLE ANALYTICAL PARAMETERS
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Chemical Class or Individual COPC	Chemical Class or COPC Full Name	Soil		Water		Notes
		Method	RL/MDL (mg/kg)	Method	RL/MDL (µg/L)	
Nitroglyerine (trinitroglycerol)	-	EPA 8332	-	EPA 8332	-	
Pentachlorophenol	-	EPA 8270	0.67	EPA 515.1	0.1	
Phenol		EPA 8270	0.33/ 0.03	EPA 8270	10/ 0.5	Report to MDL.
Propiconazole (Banner)	-	NA	NA	NCL	5	
Resorcinol	-	EPA 8270	-	EPA 8270	100/	Add to compound list. (C&T 8270 added compound.)
Roundup (glyphosate)	-	NCL	0.05	EPA 547	5	Herbicide
Spike 80W (tebuthiuron)	-	NCL	0.2	NCL	2	Herbicide
Subdue 2E (Apron, Metalaxyl)	-	None	NA	EPA 632M	10	Fungicide
Tetrachlorophenol	-	EPA 8270	-	EPA 8270	10/-	Add to compound list. (C&T 8270 added compound.)
Trisodium nitrilotriacetate monohydrate (Nitrilotriacetate, trisodium monohydrate)	-	None	None	GC/ Nitrogen-specific detector	-	See also nitrilotriacetic acid and its salts.
Truban (etridiazole)	-	NCL	0.02	NCL	-	Fungicide (RWQCB); See also Banrot

TABLE 3

SAMPLE ANALYTICAL PARAMETERS
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Chemical Class or Individual COPC	Chemical Class or COPC Full Name	Soil		Water		Notes
		Method	RL/MDL (mg/kg)	Method	RL/MDL (µg/L)	

Notes

µg/L = microgram(s) per liter
C & T = Curtis & Tompkins, Ltd.
COPC = chemical(s) of potential concern
DCA = dichlorethane
EDB = ethyl dibromide
EPA = United States Environmental Protection Agency
ESL = environmental screening level
GC = gas chromatograph
MDL = method detection limit
mg/kg = milligram(s) per kilogram
MS = mass spectometry
NCL = North Coast Laboratories, Ltd.
RL = reporting limit
RWQCB = Regional Water Quality Control Board
TCDD = 2,3,7,8-tetrachlorodibenzo-p-dioxin

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Parcel 1					
Glass Beach #1	No further action	None		Remove debris	None
Glass Beach #2	No further action	None		Remove debris	None
Glass Beach #3	Remove debris visible along coastal bluffs	None		Remove debris	None
Soil Stockpiles	No further action	None		None	None
Pump House	Continue quarterly ground water monitoring and sampling of wells in Parcel 2	Additional investigation required	Monitoring well at P1-16	None	Borings / soil and grab ground water sampling, and monitoring well
Fire Water Pond	No further action	None		No further action	No further action
Parcel 2					
General/ Ground Water Monitoring		Include SVOCs	Added SVOCs	None	Include additional analytes. Continue quarterly ground water monitoring and reporting.

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Resaw #5 Glue Lam	Add VOCs analysis to ground water sampling plan for next monitoring and sampling event. Remove foundation of Resaw #5 and Glue Lam areas upon demolition and excavate soil in vicinity of P2-3 and P2-6 to a minimum depth of 3 ft. bgs due to TPHd impacts. Continue quarterly ground water monitoring and sampling. No further action is required in remaining area.	Excavate soils also at P2-4. Investigate ground water at P2-2. Install downgradient monitoring well.		None	Install monitoring well downgradient of P2-2
Breezeway	No further action			No further action	No further action
Dry Shed #2	No further action			No further action	No further action
Helicopter Landing Pad	Continue quarterly ground water monitoring and sampling	Install downgradient monitoring well	No further action	None	Install monitoring well downgradient of landing pad
Parcel 3					
Scrap Yard	No further action		Deeper sample for PCBs, TPHd,o w/ SGCU. Also excavate soils at P3-3 and sample for PAHs, PCBs, metals.	Excavation of geophysical anomalies	None
Railroad Spurs	Further investigate soil at P3-12	Additional soil and ground water investigation at additional railroad track locations		None	Borings / soil and grab ground water sampling

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Explosives Bunker	None	None	None	None	Borings / soil and grab ground water sampling
Planer #50	No further action			No further action	No further action
Former Planer #1	Continue quarterly ground water monitoring and sampling	Investigate transformer between Planer Numbers 1 and 50. Additional ground water investigation at impacts and downgradient locations.		None	Boring / soil sampling at transformer. Borings / soil and grab ground water sampling at Planer #1 and downgradient.
Dry Sheds #4 and #5	No further action	Sample ground water for pentachlorophenol and tetrachlorophenol at four general locations.		None	Verify reported location of former dip tank in advance of ground water investigation. Four grab ground water samples, analyze for chlorophenols.
Former Mobile Equipment Shop	Remove catch basin and sump and adjacent soils. Remove concrete foundations of former buildings. Continue quarterly ground water monitoring and sampling.	Analyze samples for PAH at locations with elevated TPH. Investigate extent of MTBE. Also investigate ground water in upgradient investigation for VOCs and also TPHg in P3-28.		Removal of foundations, soil sampling, and excavation (if warranted)	Borings / soil and grab ground water sampling to investigate PAHs, MTBE, and VOCs, followed by monitoring well installations

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Construction Engineering	No further action	Investigate paint storage shed		None	Borings / soil and grab ground water sampling at Paint Storage Shed
Kilns Area	No further action			No further action	No further action
Building #11: Compressor House (adjacent to Sawmill #1 in Parcels 3, 4, and 5)	Remove foundations upon building demolition and excavate soils at P3-47 (minimum 1 ft. bgs)	Further investigation. Deeper excavation at P3-47.		Foundation removal and sampling, excavation if warranted	None
Machine Shop and Sheet Metal/Plumbing/ Plant Supply	Remove foundation and excavate surface soils (upon building demolition). Continue quarterly ground water monitoring and sampling.			None	Borings / soil and grab ground water sampling
Covered Shed	Further investigate soils at P3-54			None	Borings / soil and grab ground water sampling.
Overhead Transformers	No further action			No further action	No further action
Parcel 4					
Ponds (Log Pond, North Settling Pond, Collection Pond, South Settling Pond)	Collect sediment sample when water recedes in South Settling Pond (Pond 7)	Investigate to full depth of sediments. Investigate former pond between Fuel House and Pond 6.		None	Review historic process and waste streams at areas upgradient of ponds to verify identified chemicals of concern. Borings / sediment sampling at each pond location.
Cooling Towers		Sample directly beneath cooling towers		Remove foundation, analyze soil and ground water for total and hexavalent chromium	None

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Equipment Fueling Area by Hog Fuel Pile		Investigate petroleum impacts after AST lines removed		None	Verify AST line location and target analytes, remove lines. Borings / soil and grab ground water sampling.
Former Bunker Fuel ASTs	Investigate geophysical anomaly. Investigate soil and ground water at P4-17.	Investigate extent of petroleum impacts		None	Verify former AST locations, target analytes. Excavate area of geophysical anomaly. Borings / soil and grab ground water sampling.
Building #17: Power House Fuel Storage	No further action			Foundation removal and sampling, excavation if warranted	None
Building #13: Power House	Investigate soil and ground water underneath Power House following demolition. Investigate geophysical anomaly. Continue quarterly ground water monitoring and sampling.	Investigate paint shed south of the Power House		Foundation removal and sampling at Powerhouse and Paint Shed, excavation if warranted	None
Press Building	No further action	Investigate extent of contamination		Foundation removal and sampling, excavation if warranted	None
Oil Storage Shed	No further action	Investigate vertical extent of petroleum, including directly beneath shed		Foundation removal and sampling, excavation if warranted	None
Transformers	No further action			No further action	No further action

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Parcel 5					
General / Ground Water Monitoring		Include Chlorinated VOCs	Added chlorinated VOCs	None	Continue quarterly ground water monitoring and reporting, include testing for chlorinated VOCs
Building #12: Sawmill #1 (duplicate listing; also in Parcels 3 and 4)	Continue quarterly ground water monitoring and sampling. Remove foundation and excavate soils in Sawmill #1 area.	Investigate open refuse fire location south of Sawmill #1. Investigate areas south of east end of Sawmill #1 noted as "No 5 Shingle Mill" and "Eng Ho" noted on historic maps.		Foundation removal and sampling at Sawmill #1, excavation if warranted	Borings / soil and grab ground water sampling at former Open Refuse-Fire location, #5 Shingle Mill, and Engine House south of former Sawmill #1
Truck Wash		Investigate open pit that received truck wash wastewater. Investigate former AST and oil trap.		None	Borings / soil and grab ground water sampling
Log Pond (duplicate listing; also in Parcel 4)	Collect sediment samples	Investigate to full depth of sediments.		None	Review historic process and waste streams at areas upgradient of ponds to verify identified chemicals of concern. Borings / sediment sampling.

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Area West of Mobile Equipment Shop (includes underground lines to fuel area, diesel concrete pad, and possible old diesel AST location)	Continue quarterly ground water monitoring and sampling. Upon demolition, remove foundation and excavate soils in area of P5-25, P5-26, and P5-27.	Investigate extent of petroleum impacts. Include chlorinated VOCs in ground water sampling and evaluate upgradient source. Remove fuel lines and sample soil. Investigate former 1,000-gallon UST noted on historical facility map.		None	Borings / soil and grab ground water sampling. Investigate former UST and possible AST locations.
Transformer Pad	No further action	Investigate extent of PCBs in soil		None	Borings / soil sampling and analysis for PCBs
Mobile Equipment Shop	Continue quarterly ground water monitoring and sampling. Upon demolition, remove foundation and excavate soils in area of P5-22, P5-23, and P5-24.	Investigate Waste Diesel UST at northwest corner of Mobile Equipment Shop noted on historical facility map		None	Borings / soil and grab ground water sampling. Investigate former UST.
Washdown Building	No further action			None	None
Fuel Storage and Dispenser Building	Continue quarterly ground water monitoring and sampling. Further investigation of soil and ground water to west.			None	Borings / soil and grab ground water sampling
Tire Shop	Further investigation of soil and ground water southwest of Tire Shop.			None	Borings / soil and grab ground water sampling

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Gas Station Area	No further action by Georgia-Pacific. Cleanup currently conducted by others with RWQCB oversight.			None	Ground water sampling of existing monitoring well network
Old Shingle Mill	No further action			No further action	No further action
Log Pond East Fill Material Area	Further investigation of soil and ground water	Investigation should extend down to native material		None	Geophysical survey limits of fill. Borings / soil and grab ground water sampling. Investigate to native material.
Former Boarding House Area	No further action	Verify that borings for former Oil House were located correctly		None	Verify that borings for former Oil House were located correctly. Borings / soil and grab ground water sampling.
Parcel 6					
Hazardous Waste Storage Area	No further action	Investigate extent of PCBs in soil at P6-1 and extent of petroleum impacts in area		None	Borings / soil and grab ground water sampling
Planer #2	No further action	Investigate extent of TPHd in ground water. Investigate compressor house indicated on historical site map. Investigate plywood plant impacts. Investigate former gasoline pump on 1962 historical site map.		None	Evaluate historical operations at plywood plant to identify COPCs. Borings / soil and grab ground water sampling.

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Truck Shop		Investigate location indicated on 1962 historical site map		None	Borings / soil and grab ground water sampling
Shipping Office (Former Vehicle Maintenance Shop)	Further assess TPHd in shallow soil. Further investigate source of geophysical anomaly.	Investigate petroleum impacts at P6-14. Investigate Oil House indicated on 1962 historical site map. Investigate geophysical anomaly.		None	Borings / soil and grab ground water sampling. Excavate apparent geophysical anomaly.
Former AST	Further assess TPHd in shallow soil. Install one ground water monitoring well.			None	None
Log Pond West Fill Area	Install one ground water monitoring well (further assess TPHd, TPHo in soil and ground water)	Install three monitoring wells. Perform geophysical survey.		None	Perform geophysics, target debris at Fill Area. Borings / soil and grab ground water sampling, investigate to native material.
Former Cooling Towers	No further action			No further action	No further action
Transformers	No further action			No further action	No further action
Parcel 7					
Haz Mat Storage Area	No further action	Investigate petroleum impacts		None	Borings / soil and grab ground water sampling
Sawmill #2	Excavate soils at P7-3 through P7-5. Continue quarterly ground water monitoring and sampling.	Concurs		None	None

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Beehive Burner and Fuel ASTs	Further investigate soils at P7-10 for TPHd (w/SGCU)			None	Provide map showing geophysical survey results and boring locations. Borings / soil and grab ground water sampling.
Transformers	No further action			None	No further action
South Ponds	No further action	Sample at former diesel tank, generator, and pump area		None	Borings / soil and grab ground water sampling at former diesel tank, generator, and pump. Sediment sampling at each pond location.
Sediment Drying Area	No further action	Address disposition of ash pile		None	Evaluate past activities, processes, and waste streams to support selection of COPCs. Collect Ash Stockpile samples.
Existing Ground Water Wells	Abandon wells	Concurs		None	Abandon wells
Soil and Ash Stockpiles	Remove stockpile (offsite disposal or onsite treatment)	Concurs		None	Stockpile sampling. Remove stockpile (offsite disposal or onsite treatment)

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Parcel 8					
Airstrip Fueling Area	No further action	Investigate structures near southern end of runway visible in 1966 aerial photograph	Include TPHo in future sampling	None	Boring / soil and grab ground water sampling.
Disturbance along Coastal Region	Collect grab ground water sample at P8-T2, analyze for TPHd with SGCU	Did not reach native. Investigate and analyze for PAHs.	Include TPHo in future sampling	None	Perform geophysics, target debris at railroad tracks. Investigate to native material. Add TPHo and PAH analyses of soil samples.
Clinker Piles	No further action	Investigate and analyze for PAHs	Include TPHo in future sampling	None	Additional stockpile sampling and analyses
Sheep Barn	No further action		Include TPHo in future sampling	None	No further action
Parcel 9					
Tree Nursery Area	Further investigation of ground water for Atrazine and Tebuthiuron	Investigate vertical extent of pesticides at sump identified in 1983 letter. Verify chemicals of concern.		None	Confirm target analytes. Additional borings / soil and grab ground water sampling.
Scrap Metal Area	No further action			No further action	No further action
Transformer	No further action			No further action	No further action

TABLE 4

SITE RECOMMENDATION SUMMARY
Georgia-Pacific Corporation California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Area of Interest	Phase II ESA Recommendations	RWQCB Comments	TRC Response to Comments September 9, 2004	AME Recommendations Work Plan March 21, 2005	AME Recommendations Work Plan May 31, 2005
Parcel 10					
Clinker Ash/Scrap Piles	No further action	Evaluate PAHs reported in clinker ash sample. Address status of remaining ash and clinker piles.		Excavate geophysical anomalies	Additional clinker ash sampling and evaluate removal and treatment options
Fill Material Area	No further action		Metals concentrations are below EPA Region IX PRGs	No further action	No further action

Notes

AME = Acton · Mickelson · Environmental, Inc.
AST = aboveground storage tank(s)
bgs = below ground surface
COPC = chemical(s) of potential concern
EPA = United States Environmental Protection Agency
ft = feet or foot
MTBE = methyl tertiary-butyl ether
PAH - polynuclear aromatic hydrocarbon
PCB = polychlorinated biphenyl
PRG = preliminary restoration goal
ESA = Environmental Site Assessment
RWQCB = Regional Water Quality Control Board
SGCU = silica gel clean-up
SVOC = semi-volatile organic compound
TPH = Total Petroleum Hydrocarbon
TPHd = Total Petroleum Hydrocarbon(s) as diesel
TPHg = Total petroleum Hydrocarbon(s) as gasoline
TPHo = Total Petroleum Hydrocarbon(s) as motor oil
TRC = TRC Customer-Focused Solutions, Inc.
UST = underground storage tank
VOC = volatile organic compound

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.1 Parcel 1		
5.1.1 Pump House		
• Two direct push soil borings will be advanced west of the Pump House, with continuous soil and grab ground water sampling performed at each soil boring.	Select soil and ground water samples will be analyzed for TPHd, TPHo, and VOCs.	Based on the analytical results, one or more ground water monitoring wells will be installed with 10 feet of screen casing as described in the SAP (Appendix A) to evaluate ground water conditions in the area.
5.1.2 Explosives Bunker		
• The interior of the bunker will be inspected with a remote/fiber optic camera to verify that it is empty. • Two direct push soil borings will be advanced to the water table. One boring will be located immediately outside the door on the north side of the bunker, and one boring will be located 50 feet to the north in the area of the former wooden shed (Figure 5).	Soil and grab ground water samples will be analyzed for nitrate and nitroglycerine.	
5.2 Parcel 2		
5.2.1 High-Ceiling Wooden Warehouse		
• Two ground water monitoring wells will be constructed and screened from 5 to 15 feet bgs. – One ground water monitoring well will be installed west of the Breezeway between the Resaw #5 and Glue Lam Areas, downgradient of monitoring well MW-2.3. ▪ Based on a northwesterly historical ground water-flow direction in this	Soil and ground water samples will be collected and selectively analyzed for TPHd, TPHg, VOCs, phenol, resorcinol, and CA Title 22 metals.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
area, the monitoring well will be located approximately 50 feet west of the Breezeway to evaluate the downgradient extent of ground water TPHd impact reported at soil borings P2-2, P2-4A, P2-5, and P2-6, and monitoring well MW-2.3. – One monitoring well will be installed southeast of soil boring P2-2 to evaluate ground water conditions upgradient of the facility.		
5.2.2 Helicopter Landing Pad		
• Two ground water monitoring wells will be constructed and screened from 5 to 15 feet bgs. – One monitoring well will be installed northwest of monitoring well MW-2.1 to evaluate downgradient ground water conditions. – One monitoring well will be installed northwest of soil boring P2-11 to further evaluate TPHd impact reported in the grab ground water sample from that soil boring.	Soil and ground water samples will be collected and selectively analyzed for TPHd, TPHg, VOCs (including benzene, toluene, ethylbenzene, and xylenes), and CA Title 22 metals.	
5.3 Parcel 3		
5.3.1 Railroad Spurs		
• A total of 12 soil borings. – Two of the soil borings along the Railroad Spur will be located near previous soil boring P3-12 and continuously sampled to the water table, where grab ground water samples will be collected to evaluate the lateral and vertical extent of COPC impact where the soil TPHd concentration is the highest.	Soil and ground water samples will be analyzed for TPHd, VOCs, PAHs, and CA Title 22 metals.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.3.2 Former Planer #1		
• Four direct push soil borings with grab ground water sampling will be advanced and continuously soil sampled to the water table at locations intermediate to former soil borings 98-P1-1 through 98-P1-4.	Select soil samples will be analyzed for pentachlorophenol, tetrachlorophenol, dioxins and furans (where pentachlorophenol is detected), propiconazole, didecyldimethylammonium chloride (DDAC), TPHd, TPHo, and VOCs.	
• Three direct push soil borings will be advanced and continuously soil sampled to the water table in the former transformer area between Former Planer #1 and Planer #50.	Selected soil samples will be analyzed for PCBs.	Based on the findings an evaluation will be made to select monitoring well locations (tentative locations are shown on Figure 7): One ground water monitoring well will be constructed where sample analysis indicates the greatest potential impact and screened from 5 to 15 feet bgs, and a second monitoring well will be installed downgradient of the first monitoring well as described below and

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
		based on the historical ground water flow direction. One ground water monitoring well will be constructed and screened from 5 to 15 feet bgs to characterize TPHd and TPHo impact downgradient of Former Planer #1.
• Two direct push borings with soil and grab ground water sampling will be advanced at the two sand- and wood-filled foundation pits in the northeast area of Former Planer #1.	The grab ground water and selected soil samples will be analyzed for TPHd, TPHo, PAHs, and VOCs.	
5.3.3 Dry Shed Numbers 4 and 5		
• Two soil borings will be advanced and continuously soil sampled down to the water table, where grab ground water samples will be collected, within the Former Lumber Treating Building Area. – Of the two soil borings, one will be located approximately 40 feet south of the northwest corner of Dry Shed #4 and the second approximately 60 feet north of the northwest corner. • One soil boring further downgradient will be advanced and continuously soil sampled down to the water table, where a grab ground water sample will be collected, approximately 75 feet west-southwest of the northwest corner of Dry Shed #4.	Soil and ground water samples will be selectively analyzed for pentachlorophenol, tetrachlorophenol, and dioxins and furans (where pentachlorophenol is detected).	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.3.4 Former Mobile Equipment Shop		
• Three soil borings with grab ground water sampling will be advanced northeast, west, and southwest of the Former Mobile Equipment Shop. • Based on an evaluation of data from the initial borings, approximately three ground water monitoring wells will be constructed in the vicinity of the Former Mobile Equipment Shop (soil samples will be collected at 5-foot intervals during drilling, and grab ground water samples will be collected at the water table).	Soil and ground water samples will be selectively analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, ethylene glycol, and PAHs.	
5.3.5 Construction Engineering		
• Two soil borings will be advanced with a direct push drill rig and continuously soil sampled to the water table, where grab ground water samples will be collected, in the area of the portable storage shed.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, PCBs, CA Title 22 Metals, and PAHs.	A ground water monitoring well (with 10 feet of screen casing) may be installed, if warranted, based on the analytical results of grab ground water samples.
5.3.6 Machine Shop / Sheet Metal / Plumbing / Plant Supply		
• Ten soil borings will be advanced at locations where sample analysis reported impact by petroleum hydrocarbons and continuously soil sampled down to the water table, where grab ground water samples will be collected (this drilling program will be undertaken following building demolition under a future CDP). – Three direct push soil borings will be advanced around previous soil boring P3-49 to evaluate the extent of COPC impact in soil in the area near the Storage Shed. – Three soil borings will be advanced near previous soil boring P3-51 (interior of the Machine Shop) to evaluate the extent of COPC impact in soil within the structure. – Four soil borings will be advanced near previous soil boring P3-50 and the oil-stained area at the southwest corner of the Machine Shop.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, PCBs, PAHs, and CA Title 22 metals.	If warranted, additional soil boring locations will be evaluated based on the analytical results.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.3.7 Covered Shed		
• Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, following demolition of the building under a future CDP. – One soil boring will be advanced east of the building. – One soil boring will be advanced within the building footprint. – One soil boring will be advanced west of the building.	Soil samples will be selected for laboratory testing based on visual field observations and PID screening. Soil and ground water samples will be analyzed for TPHd, TPHo, VOCs, PAHs, and CA Title 22 metals.	
5.4 Parcel 4		
5.4.1 Ponds		
• Three soil borings will be advanced in each of Ponds 6 and 7 and continuously sampled until native material is encountered. • Three soil borings will be advanced in the Former South Pond Area and one soil boring will be advanced in the Former North Pond Area and continuously sampled until native material is encountered. • Sediment samples will be collected at each pond using the following general procedure. – The sampling location will be land surveyed using GPS equipment. – The water depth will be measured at each sampling location using a weighted tape measure. – Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment. – An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location. - Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment	Sediment samples will be selectively analyzed for TPHg, TPHd, TPHo, VOCs, PAHs, cyanide, PCBs, dioxins and furans, hexavalent chromium (Cr VI), and CA Title 22 metals. Surface water samples will be field-filtered and analyzed for CA Title 22 metals.	Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
thickness. • Samples will be retained within clear acetate liners and examined both visually and with a photo ionization detector (PID) or flame ionization detector (FID) for COPC impact evidence. • A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.		
5.4.2 Equipment Fueling Area near the Hog Fuel Pile		
• Two direct push borings will be advanced and continuously soil sampled down to the water table, where grab ground water samples will be collected.	Soil and ground water samples will be selectively analyzed for target-analyte compounds associated with diesel fuel (i.e., TPHd, BTEX, and PAHs).	
5.4.3 Former Bunker Fuel Aboveground Storage Tanks		
• Four direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the impacted area identified in the 1992 GTI investigation report.	Soil and ground water samples will be selectively analyzed for TPHo, TPHd, PAHs, and CA Title 22 metals.	After reviewing the analytical data, additional soil boring locations may be selected to further assess the extent of soil and ground water COPC impact.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.5 Parcel 5		
5.5.1 Truck Wash Pit		
• RWQCB memos and photographs will be reviewed to assist sampling location placement. • Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the area (discussed in Section 5.5.5.3 also).	Soil and ground water samples will be analyzed for TPHg, TPHd, TPHo, VOCs, CA Title 22 metals, and PAHs based on visual observations and PID screening.	
5.5.2 Mobile Equipment Shop		
Soil sampling of areas beneath foundations will be conducted following foundation excavation and removal under a future CDP. Proposed investigation (see Figure 9) includes: • The fuel-transmission pipeline west of the building will be excavated and removed. Soil in the excavation will be assessed for petroleum impact. If warranted, soil samples will be collected from the excavation for laboratory analysis. • Four soil borings will be advanced and continuously sampled down to the water table, where grab ground water samples will be collected to aid in the placement of ground water monitoring wells, outside of the area encompassed by previous soil borings P5-22 through P5-24 to characterize the lateral and vertical extent of soil COPC impact. • At least one soil boring will be advanced and continuously sampled down to the water table, where a grab ground water sample will be collected to aid in the placement of ground water monitoring wells, at the north shed to evaluate potential sources of COPC impact. • At least one soil boring will be advanced and continuously sampled down to the water table, where a grab ground water sample will be collected to aid in the placement of ground water monitoring wells, at the west shed to evaluate potential sources of COPC impact.	Selected soil and ground water samples will be analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, and PAHs. Selected ground water samples will be analyzed for ethylene glycol.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
An evaluation of ground water conditions in the vicinity of the Mobile Equipment Shop will tentatively be performed, including: • One monitoring well north of the building constructed and screened from 5 to 20 feet bgs. • One monitoring well south of the oil-change pit constructed and screened from 5 to 20 feet bgs to evaluate the extent of ground water COPC impact to the north and south. • In an effort to evaluate whether offsite sources are contributing chlorinated-VOC impact to the ground water, existing monitoring wells at the east adjacent gas station will be sampled concurrently with the onsite monitoring wells.	Ground water samples will be analyzed for TPHd, TPHg, TPHo, VOCs, CA Title 22 metals, and PAHs.	
5.5.3 Area West of Mobile Equipment Shop		
• One soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, in the area of the former 1,000-gallon Diesel UST. • One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, north of the geophysical survey area. • Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, west of the geophysical survey area. • One soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, to the southwest of soil boring SB-1 to evaluate the extent of COPC impact.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, TPHg, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.	Based on the soil and ground water analytical data, locations may be selected for ground water monitoring wells, which will be screened from 5 to 15 feet bgs.
5.5.4 Transformer Pad		
• Four direct push soil borings will be advanced and continuously sampled to the water table in the vicinity of previous sample P5-14 (located near the northeast corner of the pad).	Two soil samples from each soil boring will be analyzed for PCBs.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.5.5 Fuel Storage and Dispenser Building		
• Four direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, beneath the former AST locations (one soil boring for each AST). • Eight additional soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the perimeter of the area where petroleum impact was reported. – Two soil borings east and southwest of soil boring P5-35. – One soil boring south of soil boring P5-36. • Five soil borings in the vicinity of soil boring P5-34 and monitoring well MW-5.5 (three of these borings were described in Section 5.5.1.3 and will also serve to investigate the Truck Wash Pit).	Soil and ground water samples will be analyzed for TPHd, TPHo, TPHg, VOCs, lead, and PAHs to evaluate subsurface conditions.	Additional soil borings may be added to the program based on the findings from the initial sample analyses.
5.5.6 Tire Shop		
• One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, approximately 50 feet west of soil boring P5-37. • One direct push soil boring will be advanced and continuously sampled to the water table, where a grab ground water sample will be collected, approximately 100 feet west of monitoring well MW-5.3.	Soil and ground water samples will be selectively analyzed for TPHd, TPHg,TPHo, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.	Locations for one or two monitoring wells will be selected based on review of the ground water analytical data.
5.5.7 Fill Area at Log Pond		
• A geophysical survey of the Log Pond East Fill Area to (1) characterize the extent of the fill area; (2) identify areas of buried metal and other debris; (3) identify areas of elevated soil conductivity that may suggest the presence of soil COPC impact. The geophysical survey will use both ground conductivity and time domain electromagnetic metal (TDEM) detector surveys. The ground conductivity survey will use the Geonics EM-31, which uses electromagnetic induction to measure the ground conductivity. The Geonics EM-61 will be used for the TDEM detector	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, PCBs (selected samples), dioxins and furans (selected samples), and PAHs based on field observations.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
survey to detect buried metallic objects. Both instruments will be operated in automatic data acquisition mode and record data in a data logger along 10-foot-interval survey lines. Survey data locations will be obtained simultaneously using a global positioning system (GPS) unit rated to sub-meter accuracy, with the location data recorded in a data logger. • Fifteen direct push soil borings will be advanced and continuously sampled until native material is encountered; also, grab ground water samples will be collected at each location. – Soil borings will be located in the area bounded by monitoring well MW-5.6, the geophysical survey area, Pond 5, and the Log Pond.	field observations.	
5.5.8 Former Oil House		
• Two direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the Former Oil House.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, and PAHs.	Additional soil borings may be completed to further assess the extent of soil and ground water impact based on a review of the initial chemical data.
5.5.9 Former Open Refuse-Fire, Engine House, and #5 Shingle Mill		
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Open Refuse-Fire Area. – If soil borings cannot be located within the proposed area due to equipment access restrictions, they will be relocated nearby as feasible. • Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Engine House Area north of the existing berm (the area south of the berm may be inaccessible to drilling equipment).	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, dioxins and furans (selected samples at the Open Refuse-Fire Area), and PAHs.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Number 5 Shingle Mill Area.		
5.6 Parcel 6		
5.6.1 Former Hazardous Waste Storage Area		
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, interior of the building (near previous soil boring P6-1). • Three soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, exterior of the building (near pothole P6-PH3).	Soil and ground water samples will be analyzed for TPHd, TPHo, VOCs, CA Title 22 metals, PAHs, and PCBs.	Additional soil borings may be completed based on chemical data from the initial soil borings.
5.6.2 Planer Mill #2		
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, near previous soil boring P6-3 to evaluate soil and ground water impact by petroleum hydrocarbons. • Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, exterior of the building north and south of soil boring P6-10 to assess the extent of soil TPHd impact. • Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, north of the building in the area of the former compressor house. • Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the former dispenser and UST area near the northeast building corner.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, phenol, pentachlorophenol, tetrachlorophenol, dioxins and furans (where pentachlorophenol is detected), DDAC, propiconazole, CA Title 22 meals, and PAHs. Samples from the former UST and dispenser location will additionally be analyzed for TPHg.	Other soil boring locations may be added to the program based on a visual survey of areas containing sumps, floor cracks, surface staining, or other environmentally pertinent features.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.6.3 Former Truck Shop		
• Three direct push soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, in the Former Truck Shop Area.	Soil and ground water samples will be selectively analyzed for TPHg, TPHd, TPHo, VOCs, CA Title 22 metals, ethylene glycol (selected ground water samples only), and PAHs.	Additional soil boring locations may be added based on the analytical data from the initial three soil borings.
5.6.4 Former Vehicle Maintenance Shop (Shipping Office)		
• The 6-by-12-foot GPR anomaly located approximately 60 feet north and 10 feet east of the northeast building corner will be excavated to assess its nature. • Eight soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be taken, in the Former Vehicle Maintenance Shop, Oil House, and Number 8 Fiber Plant Areas. – Four soil borings will be advanced in the area of previous soil borings P6-12 and P6-14 to evaluate the extent of COPC soil impact reported in samples from those soil borings. – Two soil borings will be advanced in the area of the Former Oil House, based on the location shown on the 1960s facility map. • Two soil borings will be advanced in the area of the Former Number 8 Fiber Plant to investigate potential soil impact from historical operations at that facility.	Soil and ground water samples will be selectively analyzed for TPHd, TPHg, TPHo, VOCs, PAHs, CA Title 22 metals, and ethylene glycol (selected ground water samples only).	Additional soil borings may be advanced based on a review of the initial analytical data. Additional soil borings may be advanced based on a review of the initial analytical data.
5.6.5 Former Aboveground Storage Tank		
• Four direct push borings will be advanced in a square array centered on previous soil boring P6-15 and continuously sampled to the water table, where grab ground water samples will be collected.	Soil and ground water samples will be analyzed for TPHd, TPHo, PAHs, and CA Title 22 metals.	Additional boring locations may be selected based on a review of the initial analytical data.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.6.6 Fill Area		
• A geophysical survey – A ground conductivity survey consisting of a Geonics EM-31 using electromagnetic induction to measure ground conductivity – A TDEM detector survey using the Geonics EM-61 to detect buried metallic objects – Instruments will be operated in automatic data acquisition mode and record data in a data logger along 10-foot-interval survey lines. – Survey data locations will be obtained simultaneously using a GPS unit rated to sub-meter accuracy, with the location data recorded in a data logger. • Three potholes or large-diameter borings to evaluate the nature of the fill.	Soil and ground water samples taken from these three locations and analyzed for TPHd, TPHo, VOCs, PAHs, dioxins and furans (selected samples), PCBs (selected samples), and CA Title 22 metals.	Based on a review of the soil and ground water data, approximately three ground water monitoring wells will be screened from 5 to 15 feet bgs and continuously soil sampled to total depth during drilling to evaluate ground water conditions across the area.
5.7 Parcel 7		
5.7.1 Hazardous Materials Storage Area		
• Three soil borings will be advanced east, west, and south of soil boring P7-1 and continuously sampled to the water table (anticipated at approximately 7 feet bgs), and grab ground water samples collected, to evaluate the extent of soil TPHd impact reported at soil boring P7-1.	Soil and grab ground water samples will be selectively analyzed for TPHd, VOCs, CA Title 22 metals, and PAHs.	
5.7.2 Beehive Burner and Fuel Aboveground Storage Tanks		
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, north and northwest of previous soil borings P7-10 and P7-11.	Soil and ground water samples will be selectively analyzed for TPHd, VOCs, dioxins and furans (selected samples), CA Title 22 metals, and PAHs.	A map plotting the findings of the geophysical survey along with the previous and new soil boring locations will be submitted with the investigation report as requested by RWQCB.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.7.3 Diesel Tank, Generator, Pump, and South Ponds		
• Three direct push soil borings (one for each feature: Diesel AST, Pump, and Generator) will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, to investigate the equipment area north of Pond 2.	Soil and ground water samples will be selectively analyzed for TPHd, TPHo, VOCs, and PAHs.	
• Sediment samples will be collected using two soil borings performed at each pond using the following general procedure. – The sampling location will be land surveyed using GPS equipment. – The water depth will be measured at each sampling location using a weighted tape measure. – Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment. – An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location. – Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment thickness.	Samples will be analyzed for VOCs, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans (selected samples), cyanide, and PCBs (selected samples).	
• A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.	Surface water samples will be field-filtered and analyzed for CA Title 22 metals.	Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.7.4 Existing Water Supply Well Abandonment		
• Inspection of each well to assess its status and condition • Overdrilling and removal from the subsurface of well casings using hollow-stem auger equipment • Backfilling with neat cement to the total depth of each resulting hole using a tremie pipe		
5.7.5 Soil and Ash Stockpiles		
• Two samples of the Soil Stockpile.	Samples will be analyzed for TPHg, TPHd, VOCs, PAHs, and lead for disposal characterization.	
• Two samples of the Ash Stockpile.	Samples will be analyzed for dioxins and furans (selected samples), PAHs, and CA Title 22 metals for disposal characterization.	
• A waste disposal manifest will be completed for offsite disposal of both Stockpiles at a Class II landfill if chemical concentrations are within acceptable limits.		A certified waste hauler will be used to transport the soil and ash to the disposal facility.
5.8 Parcel 8		
5.8.1 Airstrip Fueling Area		
• Two soil borings will be advanced and continuously soil sampled to the water table, where grab ground water samples will be collected, near the center of each former building (based on the locations depicted in the aerial photograph).	Soil and ground water samples will be selectively analyzed for TPHg, TPHd, VOCs, and lead.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.8.2 Fill Area (Disturbance Along Coastal Region)		
• Geophysical survey of the area to evaluate the extent of fill materials and identify potential rail lines.		Based on survey results, locations will be selected and excavated using a backhoe or large-diameter auger to evaluate potential geophysical anomalies and lateral and vertical fill extent. Previous investigations indicate the potholes will begin in the vicinity of previous potholes P8-T2 and P8-PH6 and proceed radially outward (two potholes excavated in Parcel 8 are designated P8-PH6: one at the clinker piles excavated on March 17, 2003 for the Phase II investigation and another in the Coastal Disturbance Area excavated on July 20, 2004 for the additional site assessment).
• Potholes will be advanced and soil sampled to native material to assess vertical fill extent (ground water sampling in this area is not anticipated).	Soil samples will be selectively analyzed for TPHd, TPHo, dioxins and furans (selected samples), CA Title 22 metals,	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
	PCBs (selected samples), VOCs, and PAHs.	
5.8.3 Clinker Piles		
• Ten soil borings or potholes (depending on equipment accessibility) will be completed to approximately 5 feet bgs. At least one clinker and one soil sample will be collected at each location.	Soil and clinker samples will be analyzed for dioxins and furans (selected samples), CA Title 22 metals, and PAHs.	Evaluation of disposal and treatment options to decide the final disposition of the clinker material will be accomplished after reviewing the laboratory data.
5.9 Parcel 9		
• Two soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, to evaluate soil and ground water conditions near the sump located in the greenhouses east of the Chemical Mixing Shed. • Seven step-out soil borings will be advanced and continuously sampled to the water table, where grab ground water samples will be collected, at the perimeter of the area where pesticides were reported in soil and ground water samples. • A phased sample analysis approach will be used to detect Nursery COPCs (Table 1) in samples collected near the sump. The results of these analyses will determine target-analyte lists for subsequent samples collected at additional locations.	Soil and ground water samples will be selectively analyzed for pesticides and nitrate, as listed in Table 1.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
5.10 Parcel 10		
• Ten borings or potholes will be advanced at the piles to approximately 10 feet bgs to characterize chemical concentrations in stockpile and underlying soil samples. – Sample locations will be chosen randomly from a systematic grid overlay at a spacing of approximately 15 feet.	Samples will be analyzed for TPHd, TPHo, VOCs, dioxins and furans (selected samples), PCBs (selected samples), PAHs, and CA Title 22 metals.	Analytical data will be reviewed to evaluate options for the long-term disposition of the waste materials, which may include onsite treatment or offsite transport and disposal at an appropriate facility.
5.11 Pond 8 and Storm Drain		
5.11.1 Pond 8		
• Surface water sample collection at outfall. – The water sample location upstream of the outfall to the ocean will be accessed by a small boat or on foot within an area where bottom sediments have not been disturbed.	The sample will be tested for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, cyanide, and Cr VI.	
• Sediment samples will be collected using four soil borings performed at equally spaced intervals along the axis of the pond using the following general procedures. - The sampling location will be land surveyed using GPS equipment. - The water depth will be measured at each sampling location using a weighted tape measure. - Sediment thickness at each location will be measured using a sediment probe manually pushed into the sediment. - An appropriate sediment sampling device will be selected based on the sediment thickness at each sampling location. – Sediment samples will be retained from the top of the sediment and at no greater than 5-foot intervals thereafter in order to characterize the full sediment	Samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans (selected samples), cyanide, and PCBs (selected samples).	

TABLE 5

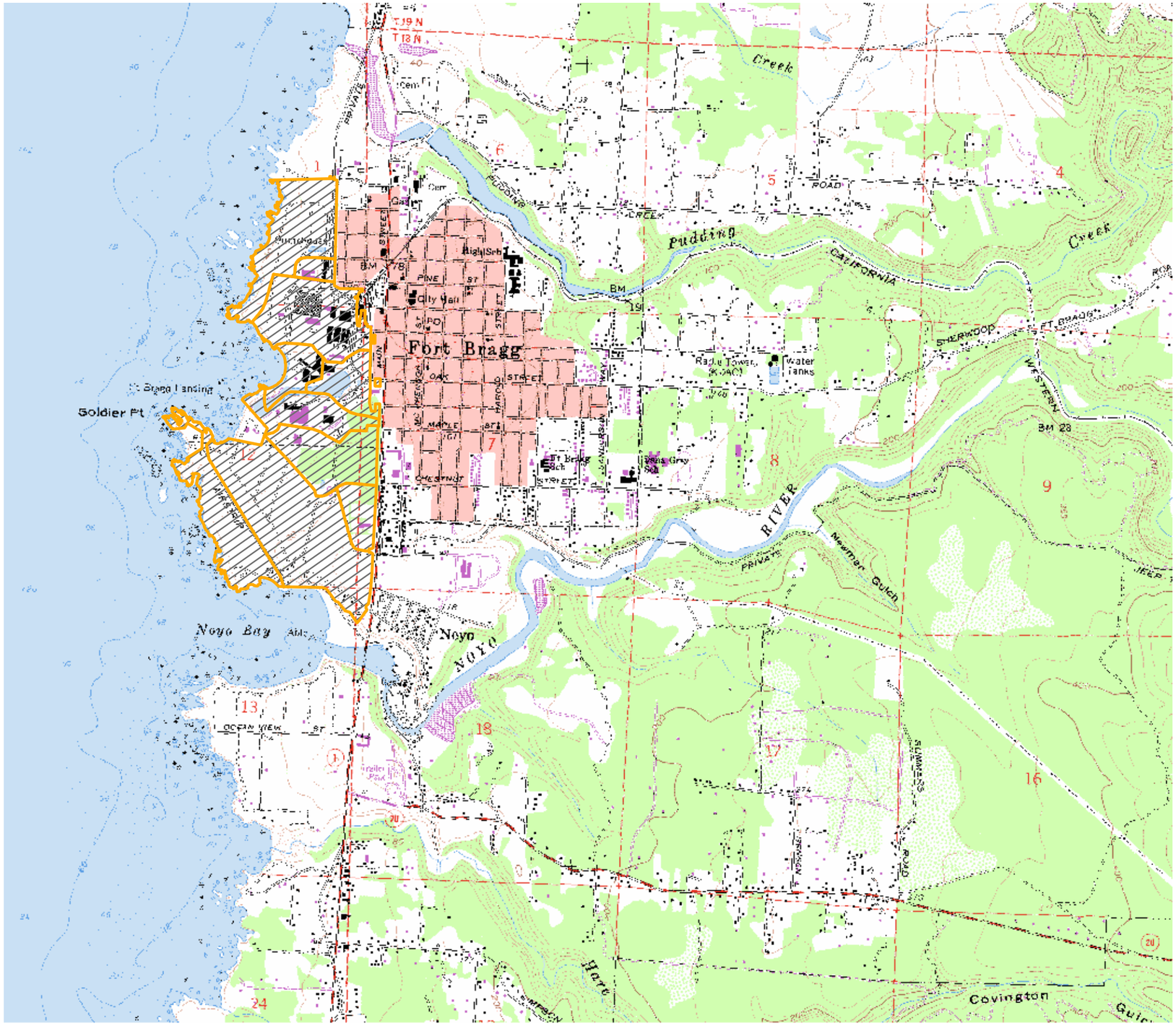
PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
thickness. Lithologic data from borings near the shoreline will be used to correlate sediment thickness and depth of nearby fill to characterize actual sediment thickness.		
• A surface water sample will be collected near the sediment-water interface at each sediment sampling location to evaluate the interaction between the water and underlying sediment.	Surface water samples will be field-filtered and analyzed for CA Title 22 metals.	Based on the results of the associated sediment sample analyses, an additional surface water sample may be collected at a later date for the analysis of COPCs reported in the sediment sample.
5.11.2 Storm Drain		
• Surface water sample collection. – If there is adequate water volume, samples will be obtained from the storm drain by immersing sampling containers directly into the water without disturbing bottom sediments. If there is inadequate water depth to immerse the containers, then water can be transferred into them from a clean sampling cup.	Surface water samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, and Cr VI.	
• Sediment sample collection. – Sediment samples can be obtained by pressing a clean stainless-steel sampling tube directly into the media to be sampled. If necessary, a slide hammer can be used to imbed the sample tube.	Sediment samples will be analyzed for VOCs, TPHg, TPHd, TPHo, PAHs, CA Title 22 metals, Cr VI, dioxins and furans, cyanide, and PCBs.	
5.12 Roadways		
• A GPS survey will be conducted to verify the roadway locations and help determine sampling locations. • Samples of surface soil will be collected at four locations judged likely for roadway	Soil samples will be analyzed for TPHo, VOCs, PAHs, CA Title 22 Metals, and PCBs.	

TABLE 5

PROPOSED SAMPLING AND ANALYSIS SUMMARY
Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Sampling	Analysis	Further Action
dust suppression. – Three samples will be collected at each location at approximately 50-foot intervals along the lines of the former roadways. – Samples will be collected beneath existing asphalt pavement, where present, to characterize surface soils and gravel roadways that were subsequently paved. – Proposed locations include roadways in the following areas: ▪ Finished lumber product storage (Parcel 1) ▪ Vicinity of the Helicopter Pad (Parcel 2) ▪ South end of the runway, near the Aircraft Fueling Area (Parcel 8) ▪ Roadway between the Powerhouse and Sawmill #1 (Parcel 4)		
5.13 Monitoring Well Installation and Ground Water Monitoring		
• Ground water monitoring wells will be considered at the following locations based on a review of soil and grab ground water data from initial sampling as discussed in Sections 5.1 through 5.3, 5.5, and 5.6: – Pump House (Parcel 1) – Resaw #5, Glue Lam Building, and Helicopter Landing Pad (Parcel 2) – Former Planer #1 and Former Mobile Equipment Shop (Parcel 3) – Mobile Equipment Shop and Area West of the Mobile Equipment Shop (Parcel 5) – Log Pond West Fill Area (Parcel 6) • Two sets of paired ground water monitoring wells and piezometers will be installed at the site (one set on Parcel 3 and one set on Parcel 5): – Monitoring wells will be screened at first-encountered ground water. – Piezometer soil borings will be drilled within 10 feet of the monitoring wells and installed using 8-inch-diameter hollow-stem auger equipment. ▪ The piezometers will extend to the top of bedrock and are intended to		Ground water monitoring wells may be planned at other locations depending on an evaluation of grab ground water sample chemistry for soil borings completed in each area.



Legend

Site

N

0 2,000 4,000 8,000

Feet

FIGURE 1

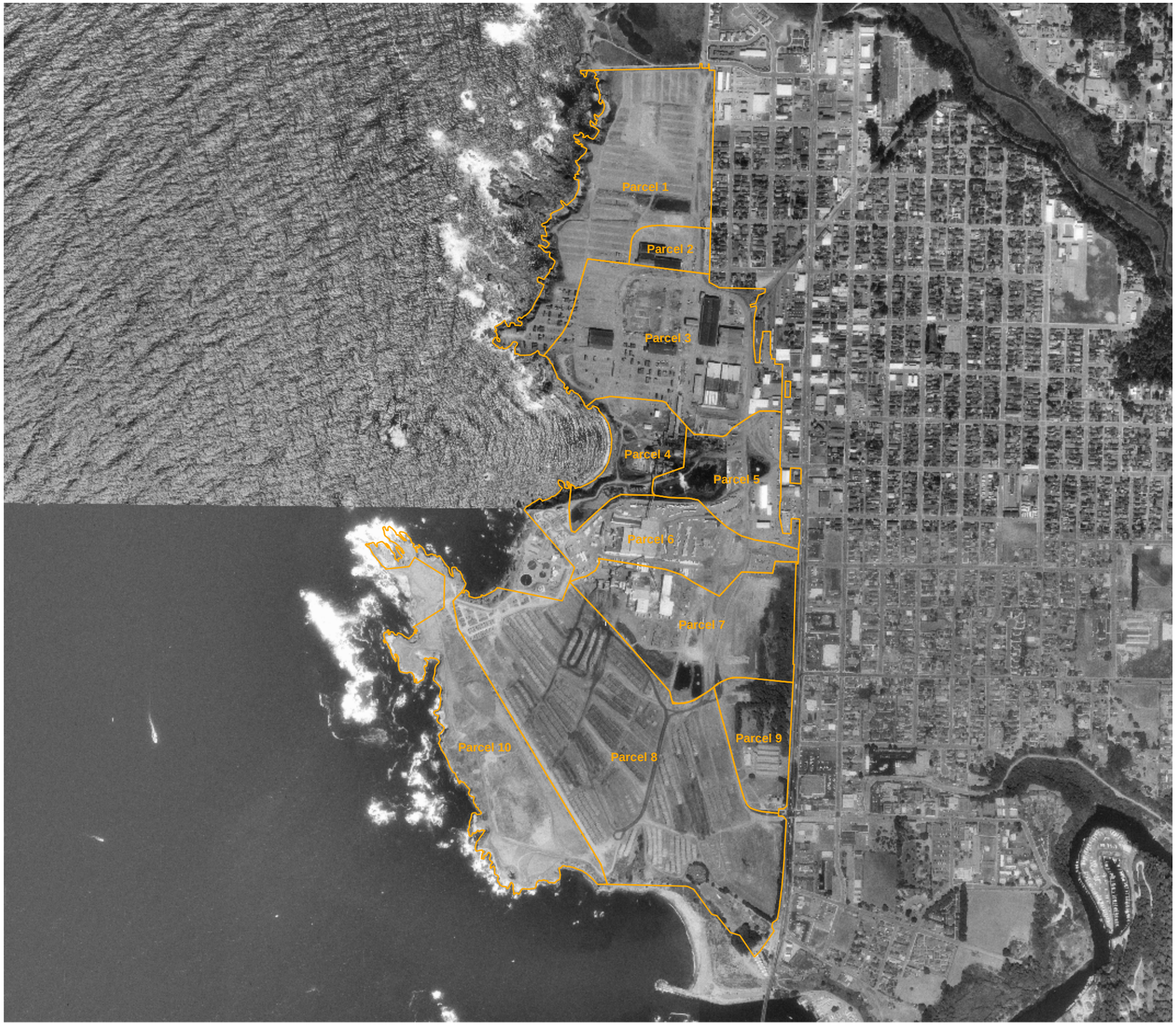
SITE LOCATION MAP

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.01	Drawn By AAC
Map File 1601701-017	Prepared By MAA
	Reviewed By
Revison/Date 0 - 5/31/05	Scale As Noted

Acton Mickelson Environmental, Inc.
Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550



N

0 1,000 2,000 4,000

Feet

FIGURE 2

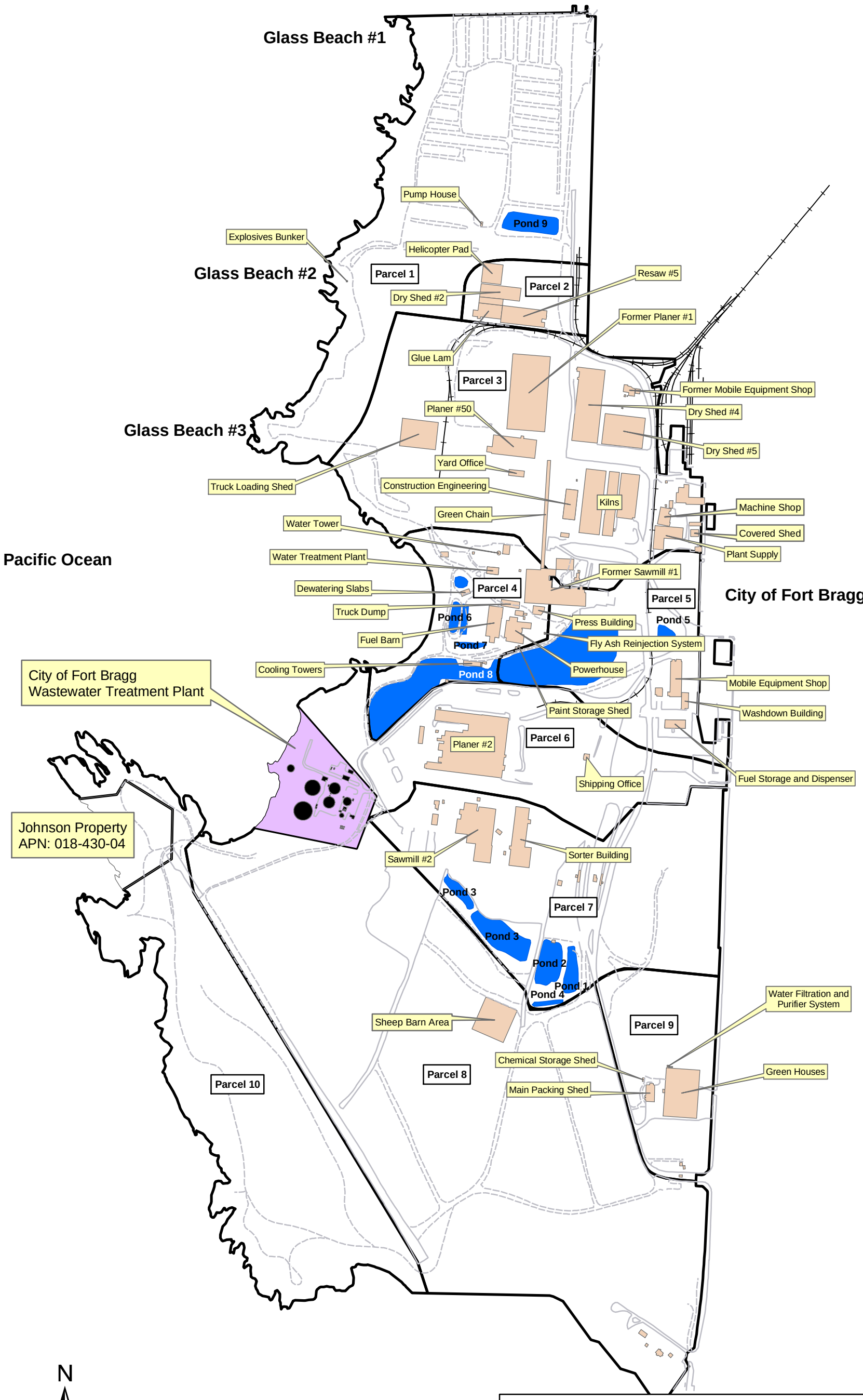
SITE MAP

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.01	Drawn By AAC
Map File sitemap	Prepared By MAA
	Reviewed By
Revison/Date 0 - 3/7/05	Scale As Noted

Acton Mickelson Environmental, Inc.
Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550



Notes:
1. All locations and dimensions are approximate.

FIGURE 3

SITE MAP WITH BUILDING LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC	Acton Mickelson Environmental, Inc. Consulting Scientists, Engineers, and Geologists
Map File 1601707-011	Prepared By JRH	
	Reviewed By JRH	5175 Hillsdale Circle #100 El Dorado Hills, California 95762 (916) 939-7550
Revison/Date 0 - 6/1/05	Scale As Noted	

Legend

- Monitoring Well Location and Designation
- Ground Water Elevation Contour in Feet Above Mean Sea Level
- [55.23] Ground Water Elevation in Feet Above Mean Sea Level
- (0.01) Liquid Phase Hydrocarbon Thickness in Feet
- Facility Structure
- Parcel Bounary

Notes:
1. All locations and dimensions are approximate.

Parcel 1
Pond 9
MW-2.1 [55.23]
MW-3.9 [57.42]
Parcel 2
MW-2.3 [56.80]
MW-3.1 [66.18]
MW-2.2 [56.30]
MW-3.2 [66.22]
MW-3.8 [57.04]
MW-3.3 [66.47]
Parcel 3
MW-3.7 [54.59]
MW-3.4 [57.08]
MW-3.5 [56.45]
MW-3.6 [55.39]
Parcel 4
MW-4.2 [21.05]
MW-4.4 [22.96]
MW-5.8 [40.94]
MW-5.7 [39.73]
MW-4.3 [NM]
Parcel 5
MW-4.1 [17.96]
Pond 6
MW-5.6 [38.48]
Pond 5
MW-5.2 [57.11]
Pond 7
MW-5.9 [25.87]
Pond 8
MW-5.1 [47.46] (0.01)
MW-5.3 [46.50]
MW-5.4 [54.35]
Parcel 6
MW-5.5 [47.07]
MW-7.1 [47.56]
Pond 3
Parcel 7
Pond 3
Pond 2
Pond 1
Pond 4
Parcel 9
Parcel 10
Parcel 8
MW-10.2 [60.14]
MW-10.4 [46.00]
MW-10.1 [58.82]
MW-10.3 [Dry]

65 60 55 50 25 15 35 20 30 40 45 50 55 60 20 25 35

N

0 500 1,000 2,000
Feet

FIGURE 4

GROUND WATER ELEVATION CONTOUR MAP
DECEMBER 2004

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.01	Drawn By AAC
Map File 1601701-006	Prepared By JRH
	Reviewed By JRH
Revison/Date 0 - 5/31/05	Scale As Noted

Acton Mickelson Environmental, Inc.
Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
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Legend

- Monitoring Well Location
- Borehole Location
- Direct Push Sample Location and Designation
- Trench Sample Location
- Proposed Monitoring Well Location
- Proposed Soil Boring Location
- Pond
- Facility Structure
- Parcel Boundary
- Railroad Track
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

Glass Beach #1

Glass Beach #2

Glass Beach #3

Parcel 1

Pump House

P1-16

Pond 9

Explosives Bunker

N

0 220 440 880

Feet

FIGURE 5

PARCEL 1
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-001	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

Acton Mickelson Environmental, Inc.
Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550

Legend

- Monitoring Well Location and Designation
- Direct Push Sample Location and Designation
- Proposed Monitoring Well Location
- Proposed Soil Boring Location
- Facility Structure
- Parcel Boundary
- Railroad Track
- Unpaved
- Pavement

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

N

0 60 120 240

Feet

FIGURE 6

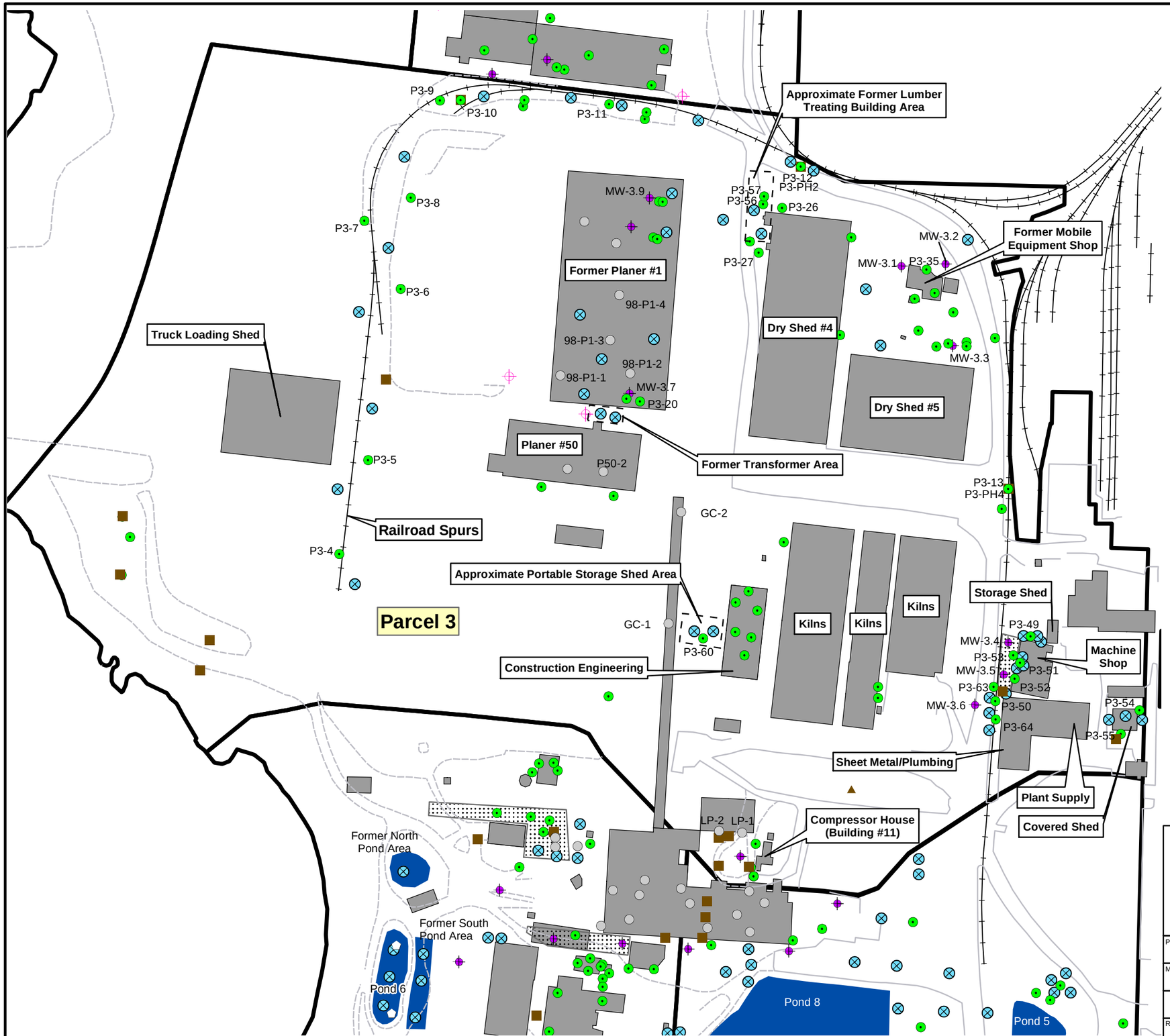
PARCEL 2
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-002	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

Acton Mickelson Environmental, Inc.
Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550



Legend

- Monitoring Well Location and Designation
- Borehole Location and Designation
- Direct Push Sample Location and Designation
- Surface Sample Location
- Trench Sample Location and Designation
- Pond Sample Location
- Proposed Monitoring Well Location
- Proposed Soil Boring Location
- Pond
- Facility Structure
- Parcel Boundary
- Railroad Track
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

FIGURE 7

PARCEL 3
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-003	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

Acton Mickelson Environmental, Inc.
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El Dorado Hills, California 95762
(916) 939-7550

Legend

- Monitoring Well Location and Designation
- Borehole Location and Designation
- Direct Push Sample Location and Designation
- Trench Sample Location
- Pond Sample Location and Designation
- Proposed Soil Boring Location
- Pond
- Facility Structure
- Parcel Bounary
- Railroad Track
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

Parcel 4

Powerhouse Fuel Storage Building (Building #17)

Former Bunker Fuel AST Area

Water Treatment Plant (Building #16)

Sewage Pumping Station

P4-19
P4-18
P4-17
P4-12
P4-11
SB-7
SB-6
SB-5

Former North Pond Area

P4-20

Former Sawmill #1 (Building #12)

Water Supply Switch Building

Dewatering Slabs

Former Equipment Fueling Area by Hog Fuel Pile

Chipper Building (Building #15)

SM-12

WCP1

MW-4.1

Pond 6

Former South Pond Area

Fuel Barn (Building #14)

Powerhouse (Building #13)

Former Open-Refuse Fire Area

WCP2

Pond 7

Pond 8 Outfall At Spillway

Pond 8

N

0 120 240 480

Feet

FIGURE 8

PARCEL 4
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-004	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/8/05	Scale As Noted

Acton Mickelson Environmental, Inc.
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5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550

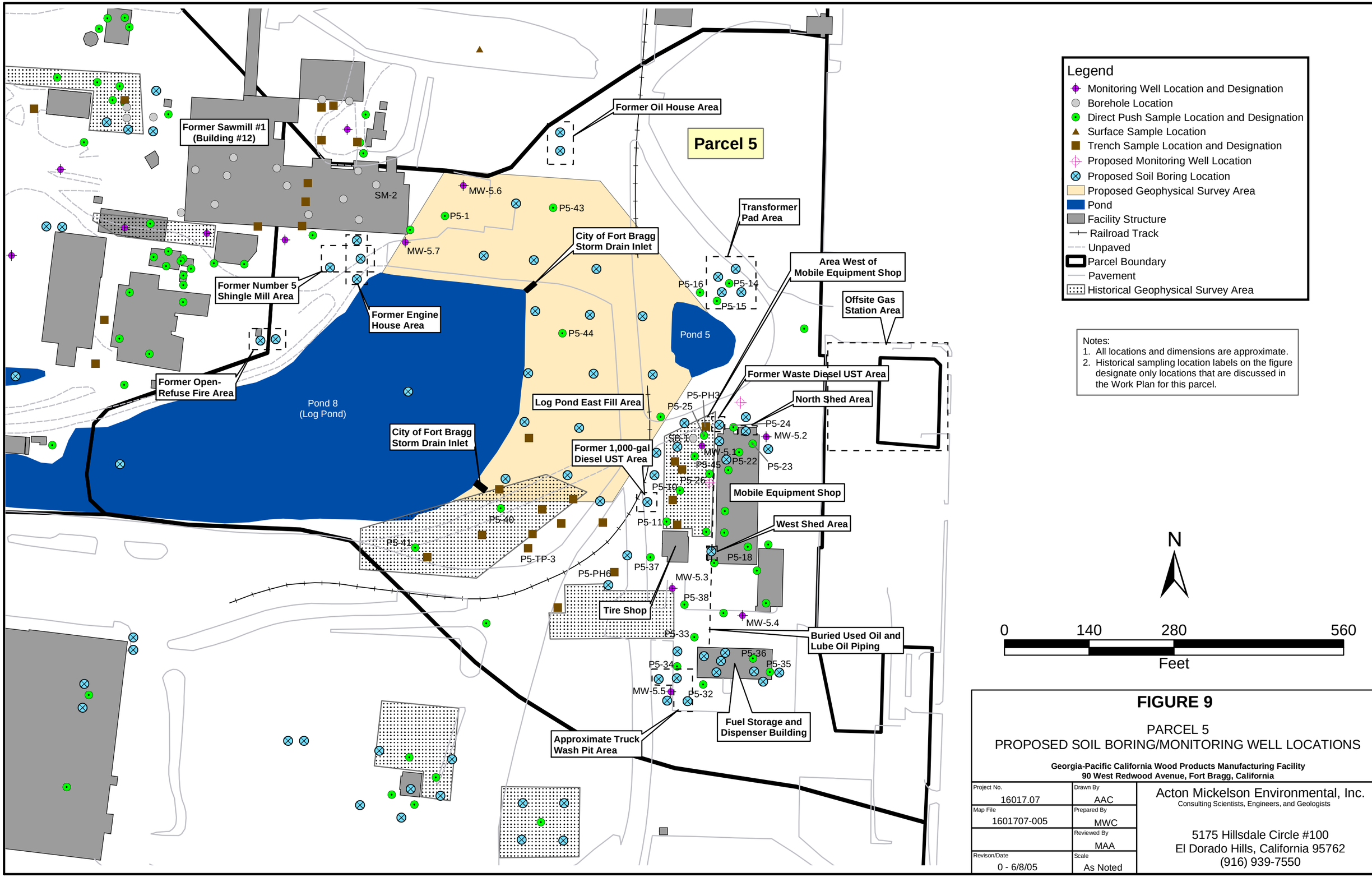

FIGURE 9

PARCEL 5
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-005	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/8/05	Scale As Noted

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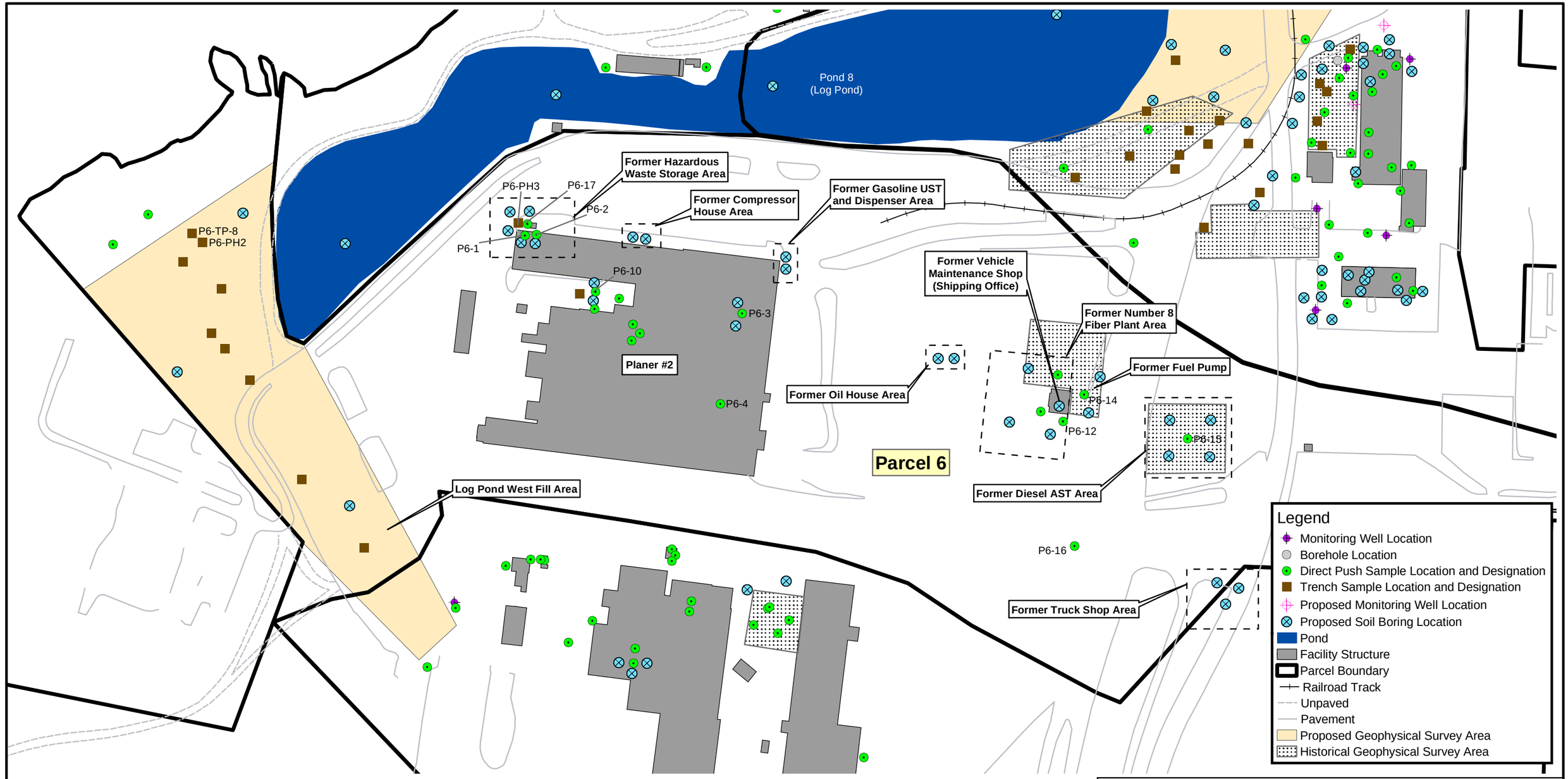

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

FIGURE 10

PARCEL 6
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-006	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

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5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550

Beehive Burner and Diesel AST Area

P7-32

P7-5

P7-2

P7-1

P7-11

P7-10

P7-12

P7-9

Soil Stockpile

Hazardous Material Storage Area

Sawmill #2

Sorter Building

Pond 3

Parcel 7

Diesel Tank, Generator, and Pump Area

Ash Stockpile

Pond 2

Pond 1

Pond 4

N

0 150 300 600

Feet

Legend

- Monitoring Well Location
- Direct Push Sample Location and Designation
- Surface Sample Location
- Trench Sample Location
- Pond Sample Location
- Composite Sample Location and Designation
- Proposed Soil Boring Location
- Proposed Stockpile Sample Location
- Pond
- Facility Structure
- Parcel Boundary
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

FIGURE 11

PARCEL 7
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-007	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

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Consulting Scientists, Engineers, and Geologists

5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550

Clinker Piles

P8-PH6-2003

Pond 3

Pond 3

Pond 2

Pond 1

Pond 4

Sheep Barn Area

Parcel 8

Fill Area

Runway

Airstrip Fueling Area

Fill Area (Disturbance Along Coastal Region)

P8-PH6

P8-T2

P8-1

Legend

- Monitoring Well Location and Designation
- Direct Push Sample Location and Designation
- Surface Sample Location
- Trench Sample Location and Designation
- Pond Sample Location
- Composite Sample Location
- Proposed Soil Boring Location
- Proposed Stockpile Sample Location
- Proposed Geophysical Survey Area
- Pond
- Facility Structure
- Historical Geophysical Survey Area
- Parcel Boundary
- Unpaved
- Pavement

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

N

0 300 600 1,200

Feet

FIGURE 12

PARCEL 8
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-008	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

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5175 Hillsdale Circle #100
El Dorado Hills, California 95762
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Pond 3
Pond 2
Pond 1
Pond 4
Parcel 9
Pump House and Tank
Water Filtration and Purifier System
P9-9
P9-18
P9-11
P9-10
P9-5
P9-4
P9-7
P9-17
P9-8
P9-19
P9-3
P9-6
Green Houses
Chemical Storage Shed
Main Packing Shed
P9-1
P9-2
Chemical Mixing Shed

Legend
- Direct Push Sample Location and Designation
- Surface Sample Location
- Pond Sample Location
- Proposed Soil Boring Location
- Proposed Stockpile Sample Location
- Pond
- Facility Structure
- Parcel Boundary
- Railroad Track
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

N

0 150 300 600
Feet

FIGURE 13

PARCEL 9
PROPOSED SOIL BORING/MONITORING WELL LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-009	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

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5175 Hillsdale Circle #100
El Dorado Hills, California 95762
(916) 939-7550

P10-PH2

Clinker and Ash/Scrap Piles

Parcel 10

MW-10.4

Legend

- Monitoring Well Location and Designation
- Direct Push Sample Location
- Trench Sample Location and Designation
- Proposed Soil Boring Location
- Proposed Stockpile Sample Location
- Parcel Boundary
- Railroad Track
- Unpaved
- Pavement
- Historical Geophysical Survey Area

Notes:
1. All locations and dimensions are approximate.
2. Historical sampling location labels on the figure designate only locations that are discussed in the Work Plan for this parcel.

N

0 220 440 880

Feet

FIGURE 14

PARCEL 10
PROPOSED SAMPLING LOCATIONS

Georgia-Pacific California Wood Products Manufacturing Facility
90 West Redwood Avenue, Fort Bragg, California

Project No. 16017.07	Drawn By AAC
Map File 1601707-010	Prepared By MWC
	Reviewed By MAA
Revison/Date 0 - 6/6/05	Scale As Noted

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